Basin Oil

HASP

8661 Dallas Ave S
Seattle, WA 98108

Location: : 8661 Dallas Avenue, Seattle, Washington

Site description: Basin Oil is located at 8661 Dallas Avenue South in South Park, a small community in the southern part of Seattle, Washington. The Basin Oil property is fenced and triangular shaped; it is bounded on the east by Dallas Avenue South; 17th Avenue South to the west; and Donovan Street to the south. Port of Seattle Terminal 117 is east of Dallas Avenue South.

SAIC conducted a file review of Basin Oil for the Terminal 117 Source Control Action plan (SCAP). The SCAP and property review describe the history and operations of Basin Oil in more detail. The nature and extent of any contamination remaining on the Basin Oil property has not been fully characterized. Because of its past use, and adjacent site soil and groundwater data, Basin Oil is a potential source of recontamination to Terminal 117 and the adjacent streets. The site was a waste oil facility/petroleum recycling and appears to have been abandoned in 2004 and is no longer in use. Only an abandoned building and concrete platforms remain on the site.

The activities to be performed for this study are intended to identify the nature and extent of contamination beneath the property. Investigation activities will include sampling and analysis of subsurface soil and groundwater.

Scope of work to be performed by SAIC and subcontractors:

SAIC

SAIC's objective is to investigate and further assess the impact of PCB, petroleum-contamination, metals and potential chlorinated solvents to the soil and groundwater on the Basin Oil property. To achieve this objective, SAIC is proposing a subsurface investigation at the site that includes the following tasks:

- Collecting two surface samples at 6 inches and 12 inches in depth.
- Clearing 12 borings down to 5 feet using a hand auger.
- Advancement of 10 soil borings using a geoprobe rig.
- Screening of soil samples for organic vapors, noting any odors or sheen.
- Collection of at least one soil sample from each boring.
- Installation of 2 monitoring wells using a limited-access hollow-stem auger drill rig.
- Monitoring and sampling the monitoring wells.
- Surveying elevation of all well casing to a determined benchmark

ULS (subcontractor to SAIC)

- Locating all conductible and non-conductible underground utilities on the property; and
- One call utility locate will be made at least 48 hours before field activities begin.

Cascade Drilling (subcontractor to SAIC)

- Hand auger to ~5 feet bgs at each boring location prior to drilling.
- Advance geoprobe borings to approximately 20 feet bgs.
- Temporarily store drill cuttings and decon water in 55-gallon sealed and labeled drums.
- Drill and install two offsite and upgradient monitoring wells with a limited-access hollow-stem auger drill rig.

Clean Harbors

- Remove drummed soil cuttings and decon and purged water for disposal. Drums will be

stored on the property within a fenced area and are planned for removal within two weeks from the end of field work.

Bush Roed & Hitchings (subcontractor to SAIC)

- Surveying elevation of all well casing to a determined benchmark

Equipment will include a geoprobe drill rig, limited-access drill rig, support truck, decon trailer, and vehicles to transport personnel and IDW.

Site Contaminants

Groundwater was collected for four quarters in 2008 from wells directly downgradient from the site (MW-1, MW-9, MW-10 and MW-11). Concentrations of arsenic (0.002 milligram per Liter (mg/L)), aroclor 1260 (0.088 micrograms per Liter (µg/L), acetone (4.5 µg/L), diesel-range hydrocarbons (0.53 mg/L) and suspended solids (537 mg/L) were detected above screening levels.

No on-site soil investigation has been performed therefore no soil data is available for review.

Approval signatures:
Signature below indicates review and approval of the plan and agreement that the anticipated hazards are correct and that planned hazard controls are sufficient.

Project Manager (PM) or Field Manager (FM) name and phone number:
Glen Vedera (PM) = 425 482-3329 ofc, 206-271-4691 cell

Signature and date:

CIH, CSP or designee name and phone number:
Steve Davis 865-481-4755 ofc, 865-414-9035 cell

Signature and date:
Stephen L Davis May 5, 2009

Commitment to implement:
Signature indicates commitment to implement this plan and ensure that project field work is conducted safely.

Field Manager name and phone number:
Gabriel Cisneros = 425 482-3301 off, 206-718-9799 cell

Signature and date:
5/5/09

Site Safety and Health Officer name and phone number:
Gabe Cisneros = 425-482-3301 off, 206-718-9799 cell

Signature and date:
5/5/09

Commitment to comply:
Signature below indicates that the individual has reviewed this plan, has received site-specific training (briefing), and agrees to comply with the requirements of this plan.

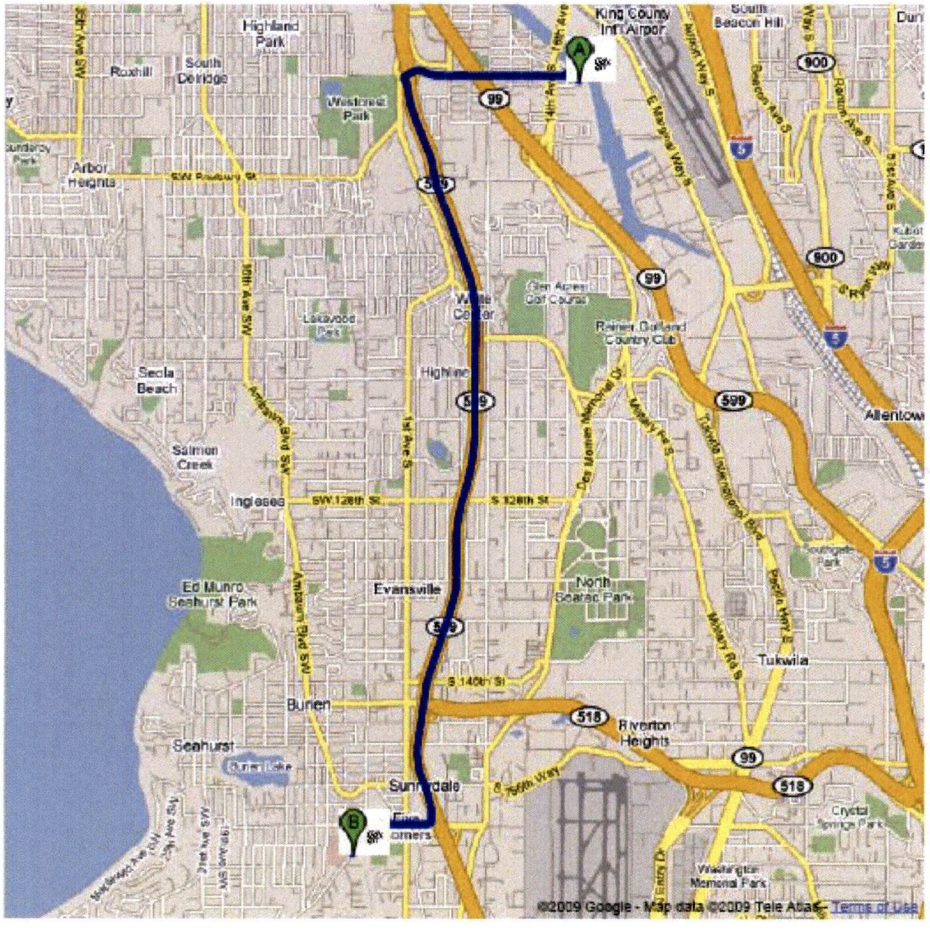
Name	Signature	Date

Potential Hazards and Emergency Information
Potential hazards
Non-SAIC personnel proximity to drilling/excavation/heavy equipment (business/passerby in/near work zone)
Traffic accidents associated with travel to and from the site.
Exposure to onsite contaminants. Chemical analytical sampling has not been conducted at this location in the past therefore there is no data available for this section.
Exposure to chemicals used on site. HCL preservative in voas for water sampling, nitric acid preservative used for metal sampling in water, Methanol and Sodium Bisulfate used for soil samples.
Noise generated from: drill rigs, pressure washers, site machinery operation, air planes overhead going to Boeing field
Lifting/moving material/equipment ≥ 50 lb. weight
Contact with overhead or buried utilities.
Contact with powered rotating, pressurized and/or hydraulic equipment
Exposure to temperature extremes.
Physical hazards slips/trips/falls, vehicle mobilization, falling objects from machinery
Exposure to hazardous energy. Pressure washer, air pressure on jack hammer
Struck by mobile/moving equipment (service truck, truck mounted drill rig)
Falls from elevated surfaces (≥ 4 ft. at facilities, ≥ 6 ft. on drilling/construction sites)
Fire
Emergency phone numbers
Medical: 911
Police/security: 911
Fire: 911
Emergency Medical Facility
Name and telephone number of nearest hospital or emergency medical service:
Directions to medical facility
Highline Medical Center
16251 Sylvester Road SW
Burien, WA
206-244-9970

A 8661 Dallas Ave S, Seattle, WA 98108

	1. Head **northwest** on **Dallas Ave S** toward **17th Ave S**	go 486 ft total 486 ft
↰	2. Turn **left** at **16th Ave S**	go 144 ft total 0.1 mi
↱	3. Turn **right** at **S Cloverdale St** About 3 mins	go 1.0 mi total 1.1 mi
↖	4. Slight **left** to stay on **S Cloverdale St**	go 141 ft total 1.1 mi
509	5. Turn **left** to merge onto **WA-509 S** About 5 mins	go 4.5 mi total 5.7 mi
	6. Take the **S 160th St** exit	go 0.2 mi total 5.9 mi
↱	7. Turn **right** at **S 160th St** About 2 mins	go 0.4 mi total 6.3 mi
↰	8. Turn **left** at **4th Ave SW**	go 26 ft total 6.3 mi
	9. Continue on **Sylvester Rd SW**	go 0.2 mi total 6.5 mi

B 16251 Sylvester Rd SW, Seattle, WA 98166



Emergency Equipment Required On Site
Cellular or satellite phone (or verify immediate access to immediately available landline)
First aid kit (10 unit unitized kit or larger)
Fire extinguisher(s) rated at least 2A and 5B– Serviced annually and inspected monthly
Eyewash rated for 15 minutes continuous flow if corrosive chemicals are poured or used (pre-preserved sample containers excluded) for sample preparation/preservation or on-site water treatment
Eyewash bottle if adding water to pre-preserved containers

Emergency Reporting

The FM will immediately report injuries or illnesses, vehicle accidents, releases (hazardous material, hazardous waste or uncharacterized waste), inspections by regulatory agencies, and any incident that could reasonably have caused a significant injury or property damage (fire, catastrophic equipment failure, capsized heavy equipment, etc.). The FM will contact emergency response organizations (if needed) and the PM. The PM will notify the client (as appropriate), Division Manager, Program Manager, and ECHS Manager. If the PM is not available, the FM will make the other notifications. See EH&S Procedures 4.1, Accident Reporting and 24, Regulatory Agency Inspections and Incident Reporting for details.

General Hazard Controls Applicable to all Work in this Program

This plan represents a good-faith effort to identify, evaluate, and prescribe controls for the hazards that will be posed by this work. Revisions to this plan will be documented. The Project Manager and CIH, CSP, or designee who originally approved the plan must approve revisions to the plan that result in decreasing or eliminating a hazard control.

This work is subject to the requirements of the SAIC Environmental, Health and Safety (EH&S) program. The FM will insure that applicable provisions of EH&S procedures are followed and that personnel have access to these procedures. Specifically applicable procedures include, but are not limited to; Procedure 4.1, Accident Reporting; Procedure 8, Hazard Communication and Hazardous Chemical Control; Procedure 12.1, Medical Surveillance; Procedure 13, Personal Protective Equipment; Procedure 20, Hazardous Waste Operations; Procedure 24, Regulatory Agency Inspections and Incident Reporting; EH&S Procedure 110, Vehicle Operation and EH&S 180, Behavior Based Safety, 15, Hearing Conservation and Noise Control; Procedure 25, Management of Investigation Derived Waste; Procedure 28, Hazardous Material Transportation; EH&S Procedure 130; Subsurface Asset/Hazard Avoidance; EH&S Procedure 150, Manual Lifting; EH&S Procedure 160, and EH&S Procedure 170. and Injury and Illness EH&S Procedure 16.

A general site map showing a central rally point is attached at the end of this HASP. **MAP ON PAGE 30.**

The FM will perform and document daily safety inspections to verify that the work is performed safely, that the requirements of this plan are met, that the public is not endangered by this work, and that no environmental releases or violations occur as a result of this work. All on-site personnel and subcontractors will be responsible to report unsafe, or potentially unsafe, conditions to the FM immediately. The FM will take action to correct any work that he/she judges to be unsafe or non-compliant with this plan. See EH&S Procedure 20 for details.

The FM will establish local assembly points for each work zone so that in the event of an evacuation personnel can be accounted for at a pre-identified location. This should include a general assembly point a safe distance along the route of travel when traveling between remote work zones.

SAIC subcontractors will be informed of the requirements of this plan and will be provided with copies or unrestricted access to this plan and must comply with the requirements of this plan. This plan does not relieve subcontractors of the regulatory requirement to provide a safe workplace for their employees. SAIC subcontractors are required to provide trained, experienced personnel and to operate equipment as required by the manufacturer's procedures, or the subcontractor's standard operating procedures; and are required to supplement the requirements of this plan as necessary to ensure that their employees perform their specific tasks safely.

Project training will include at least the following. The FM will have current hazardous waste safety training (40 hour, 3 days of OJT, 8 hour refresher within past 12 months), hazardous waste supervisor training, and sufficient experience to understand the potential hazards. All other field personnel will have current hazardous waste safety training including 40 hour, 3-day OJT and current refresher. The FM will present a project kick-off safety briefing to cover this plan, physical hazards, hazardous contaminants and chemicals, required hazard controls, and emergency contacts and additional safety briefings as needed (at least once per week). At least one person on site will have current first aid, cardiopulmonary resuscitation, and bloodborne pathogen training, unless emergency medical care is available within 5 minutes. The FM will maintain documentation of completed training on site. See EH&S Procedures 8 and 20 for details. Additional training may include, but not be limited to, Respiratory Protection as required in ECHS 9 and Hearing Conservation as required in ECHS 15.

Field personnel must be enrolled in a medical surveillance program and have current hazardous waste medical clearance. See EH&S Procedures 12 and 20 for details.

Field personnel will utilize personnel protective equipment (PPE) as directed in this plan and by EH&S Procedures 9, 13 and 15. PPE for field work will include at least safety glasses with side shields, appropriate shoes (up to safety toe shoes with metatarsal guards), work clothing including long pants and shirts with sleeves, hard hats if overhead hazards are present, hearing protection in noisy environments, chemical resistant gloves (nitrile, PVC, or similar) if handling hazardous chemicals, and heavy duty work gloves for material handling. The FM will evaluate PPE during routine inspections and will ensure that PPE is appropriate to the task. If site conditions appear to require the implementation of respiratory protection the FM will suspend the impacted task and contact the PM and the health and safety reviewer for guidance.

Prior to any excavation or drilling, the location must be verified free of subsurface assets (tanks) or utilities. See EH&S Procedure 130 and 170 for details.

Portable electrical tools will be connected through a Ground Fault Circuit Interrupter. No energized electrical components will be exposed to potential personnel contact. Conductive materials (drill rigs, back hoes, ladders, etc.) will be kept at least 10 feet from overhead power lines. ECHS Procedure 11 Lock out/tag out procedures will be employed when servicing any energized systems.

All vehicle operators must have valid driver's licenses and operate in compliance with applicable laws and regulations. Prohibited actions include driving while distracted and driving while using a cell phone. See EH&S Procedure 110 for details.

No hot work or open flame is allowed in areas where flammable substances may be present. No hot work will be initiated without express authorization of the FM for each hot work event. Flammable and combustible liquids (gasoline, kerosene, fuel oil) will be transported and stored in metal containers approved by Factory Mutual, Underwriters Labs, or equivalent or in containers provided by the vendors (example; isopropanol). Containers of hazardous chemicals must be labeled to indicate contents and hazard. MSDSs for hazardous chemicals must be available on-site. Shipment and transportation of hazardous materials must be performed per DOT or IATA requirements. See QA FTP 651 for guidance.

An exclusion zone (at least barricade tape) will be established around any work that poses a risk of exposure to; hazardous contaminants, hazardous chemicals, or physical hazards, in order to exclude unauthorized personnel. No food or drink will be allowed in exclusion zones. Personnel will wash their hands prior to eating or drinking. The FM will determine if additional controls such as sawhorse barricades, traffic cones or additional personal decontamination is needed.

Regulated (and potentially regulated) project waste will be managed per the intent of EH&S Procedure 25. SAIC personnel will not sign disposal documents without written approval from the corporate EH&S office. The written plan for disposition of potentially regulated project waste must be in place prior to generating the waste. The plan may be specified in proposal language (preferred method), incorporated into the HASP, or be a separate document. The plan must specify; anticipated type, characteristics, and quantity of wastes; requirements for storage; process for characterization by client or at least approval of characterization by client; and process for documented transfer to client or disposal company. The plan must be approved by the client, or at least submitted (documented submittal) to the client. Containers of potentially regulated wastes must be labeled or indelibly marked to indicate at least; contents (including physical state), date placed in container, source, and client's name.

The FM will ensure that equipment and supplies are available to control and remove potential spills of chemicals or contaminants. The required equipment and supplies will vary by project, type and quantity of contaminants/chemicals, and may include sorbent pads, granular sorbent, sorbent boom, open-top drums, shovels, etc.

Information for all site contaminants present in hazardous concentrations in environmental media that workers are anticipated to encounter is included as NIOSH safety cards (or equivalent) after the site map.

The FM will investigate local and state requirements and ensure that these are incorporated, as needed, into the HASP. Examples of such requirements include California Safety Codified Regulations, Title 8, Division 1, Chapter 3.2, Subchapter 2, Article 2; Permits, which requires a state permit for construction of trenches or excavations 5 feet or deeper and into which a person is required to descend.

Work areas with the potential for a fall of 4 feet or more will be provided with fall protection consisting of guardrails or personal fall arrest systems.

Each employee is empowered and expected to stop his or her own work or the work of co-workers if any person's safety or the environment are at risk. The FM is expected to support and reinforce this expectation. Stopped work will not resume until the hazard has been controlled and a review has been performed.

Each major task must have an AHA and the work must be performed as required by the AHA.

Activity Hazard Analysis		
Work Activity: Groundwater and floating product monitoring and sampling		
Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	X	
Hard Hat	X	If overhead hazards are present
Safety Glasses With Side Shields	X	
Fire Resistant Clothing		
Face Shields	X	As needed if free product or bulk corrosives handling
Goggles	X	If splash potential, pouring corrosives or free product recovery
Lifeline/Body Harness		
Hearing Protection	X	As necessary
Air Purifying Respirator		
Supplied Air Respirator – SCBA		
Welding Hood		
Welding/Pipe Clothing		
Welding Mask/Goggles		
Personal Floatation Device		
Gloves	X	Nitrile, PVC or similar for potentially contaminated material. Heavy duty work gloves for material handling.
Other	X	at least 10.0 eV PID (calibration checked daily) monitoring if free product is encountered or anticipated. Stop work if breathing zone readings exceed 5 ppm for more than 1 minute.
Safety Cones/Barricades	X	To control/alert traffic and exclude unauthorized personnel
Safety Vest	X	As necessary for traffic safety
Knee Pads		
Caution Tape	X	As needed, to exclude unauthorized personnel

Groundwater and floating product monitoring and sampling		
Job Steps	**Potential Hazard**	**Critical Actions**
Mobilize to work site	Traffic accident.	Compliance with EH&S Procedure 110, Vehicle Operation (valid drivers license, seat belt use, routine vehicle inspections, no cell phone use while driving).
Groundwater monitoring and sampling	Being struck by vehicles.	Traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades (more substantial barriers required as traffic hazard increases). Vehicle(s) placed between workers and oncoming traffic. High visibility safety vests in traffic areas. Flashing rotating beacon in high traffic parking areas or brief roadwork. MUTCD compliant traffic control plan for work in road/street, roadside parking strip, sidewalk, shoulder. All required lane closure permits from local traffic control authority must be attached to individual site sheet for work in DOT right of way. Rig/fork truck equipped with functional back-up alarm. Artificial lighting provided for work after twilight.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Lifting (musculoskeletal injuries)	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.
	Electric shock.	Portable electrical tools and all portable electrical equipment that poses a shock hazard must be connected through ground fault circuit interrupters.
	Battery Fire/Explosion	Use only batteries that are not installed in vehicles and are not being charged during use for powering equipment. If no other battery available use vehicle battery by making the final connection away from the battery or using PTO.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use areas.
	Chemical exposure	Breathing zone monitoring with at least 10.0 eV PID if free product is anticipated. Stop work if breathing zone readings exceed 5 ppm for more than 1 minute. Medical clearance for hazardous waste work. 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Wash hands before eating or drinking. Nitrile gloves for chemical/contaminant contact. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling. 15-minute eyewash must be within 20 feet if pouring corrosives. Eyewash bottle must be within 10 feet if adding water samples to pre-preserved containers.

Groundwater and floating product monitoring and sampling		
Job Steps	**Potential Hazard**	**Critical Actions**
	IDW Control	Label or mark IDW containers to indicate container number, contents (including physical state), investigation location, date of collection, and client name. Ensure that storage area provides adequate protection against physical damage or disturbance.
	Hazardous material shipping	Samples of floating product must be shipped as DOT-regulated flammable materials. See FTP 651 for guidance.

Activity Hazard Analysis

Work Activity: Subsurface soil sampling and well installation using a Geoprobe and Hollow-Stem Auger drill rig in potentially contaminated area

Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	X	
Hard Hat	X	Within 25 feet of rig or other overhead hazards
Safety Glasses With Side Shields	X	
Fire Resistant Clothing		
Face Shields	X	If air excavating, grinding, pavement saw cutting or welding, or splash potential exists
Goggles	X	If splash potential exists
Lifeline/Body Harness		
Hearing Protection		When within 25 feet of operating air excavator or drill rig
Air Purifying Respirator		
Supplied Air Respirator – SCBA		
Welding Hood		If hot work performed
Welding/Pipe Clothing		If hot work performed
Welding Mask/Goggles		If hot work performed
Personal Floatation Device		If within 6 feet of unguarded water 3 feet or more in depth
Gloves	X	Nitrile or PVC for potentially contaminated material. Heavy duty work gloves for material handling. Leather for hot work. Class 0 or greater electrical protective gloves with leather cover for hand augering
Other	X	10.0 eV PID or equivalent monitor (calibration checked daily) during intrusive work that might generate hazardous airborne chemicals. Stop work if breathing zone readings exceed 5 ppm for more than 1 minute. CGI if combustible vapors possible above 100 ppm on PID.
Fall restraint/arrest PPE		If working from elevated surface $\geq$ 6 ft. above nest lower level
Safety Cones/Barricades	X	To control/alert traffic and exclude unauthorized personnel.
Safety Vest	X	If near active traffic areas
Knee Pads		
Caution/Danger Tape	X	As needed, to exclude unauthorized personnel

Subsurface soil sampling and well installation using DPT or drill rig in areas potentially contaminated		
Job Steps	**Potential Hazard**	**Critical Actions**
Mobilize to work site	Traffic accident.	Compliance with EH&S Procedure 110, Vehicle Operation (valid drivers license, seat belt use, routine vehicle inspections, no cell phone use while driving).
Rig set-up	Being struck by vehicles.	Traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades (more substantial barriers required as traffic hazard increases). Vehicle(s) placed between workers and oncoming traffic. High visibility safety vests in traffic areas. Flashing rotating beacon in high traffic parking areas or brief roadwork. MUTCD compliant traffic control plan for work in road/street, roadside parking strip, sidewalk, shoulder. All required lane closure permits from local traffic control authority must be attached to individual site sheet for work in DOT right of way. Rig/fork truck equipped with functional back-up alarm. Artificial lighting provided for work after twilight.
	Contact with overhead structures or utilities.	FM will survey location and ensure absence of obstructions and overhead utilities prior to rig set-up. Rig will not be allowed to come within 10 feet of overhead power lines. At the time the mast is being towered up drill crew members should not be engaged in any other activity, the task at that time is to assist in towering up in the safest manner possible. At the time the mast is being towered down, other drill crew members should not be engaged in any other activity, the task at that time is to assist in towering down in the safest manner possible. The mast of the drill rig must be towered down before moving to the next location.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Lifting (musculoskeletal injuries) hazards.	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.
	Falls from elevated surface (≥6')	Compliance with ECHS 170, Fall Protection for working from elevated surfaces ≥ 6 ft. above next lower level
	Unauthorized personnel entering work zone	If structures or public access areas fall within radius of raised mast, establish a work schedule to minimize hazard to public, establish an exclusion zone boundary that unauthorized personnel can not cross, and position drill rig so as to minimize inclusion of public access areas within work zone.
Boring and addition/ manipulation of drill string	Being struck by vehicles.	Traffic controls as in step 2.

Job Steps	Potential Hazard	Critical Actions
	Rotating and/or moving equipment.	Only experienced operators. Rigs will be operated per subcontractor's standard procedures or per manufacturer's directions; all hoses and cables will be inspected daily. Rigs will have two functional kill switches or "dead-man" control. At no time should anyone work in close proximity to the rotating augers. Prior to coupling augers driller shall inspect auger joints to ensure no obvious defects that may affect auger performance. If burs are noticed on the auger ends, corrective measures must be taken, or the auger must be set aside and a different one must be used.
	Kickback	Cuttings should be removed only after drill string has come to a halt. If shoveling, long handled shovels should be used.
	Falling equipment.	No workers under suspended loads. Exclusion zone around rig. Drill string components shall be added or removed one section at a time as they are needed. Multiple drill string components shall not be added or removed from the drill string. Augers shall not be withdrawn from ground using wire rope and winch.
	Pinch	Keep hands from between drill string components. Keep fingers out of all openings.
	Unauthorized personnel entering work zone	Unauthorized controls as in step 2.
	Subsurface utilities (electric shock, fire, damage to utilities)	FM will ensure that each boring location has been cleared to preclude contact with buried utilities through compliance with EH&S Procedure 130.
	Noise	Hearing protection when within 25 ft unless equipment-specific monitoring indicates that noise levels are less than 85 decibels.
	Temperature Extremes	Temperature stress controls as in step 2.
	Lifting (musculoskeletal injuries) hazards	Lifting (musculoskeletal injuries) controls as in step 2.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use areas. Hotwork controls if welding/cutting required. Treat all sewer grates/wells as possible source of flammable gas (move 35 feet away or check with PID or CGI and cover).
	Chemical exposure	Breathing zone monitoring with at least 10.0 eV PID; action level of 5 ppm sustained for over 1 minute. Medical clearance for hazardous waste work. 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Wash hands before eating or drinking. Nitrile gloves for chemical/contaminant contact. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling.
Soil sampling	Being struck by vehicles.	Traffic controls as in step 2.
	Rotating and/or moving equipment.	Rotating/moving equipment controls as in step 6. Keep clear of all rotating/moving equipment components.

Job Steps	Potential Hazard	Critical Actions

	Falling equipment.	No workers under suspended loads. Exclusion zone around rig.
	Noise	Hearing protection when within 25 ft unless equipment-specific monitoring indicates that noise levels are less than 85 decibels.
	Temperature Extremes	Temperature stress controls as in step 2.
	Lifting (musculoskeletal injuries) hazards	Lifting (musculoskeletal injuries) controls as in step 2.
	Unauthorized personnel in work zone.	Unauthorized personnel controls as in step 2.
	Cuts/contusions	Use dedicated tube cutter or hooked safety blades when opening polymer sample tubes. Wear heavy cut resistant gloves when opening polymer sample tubes. Keep fingers from between split spoon halves.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use areas.
	Chemical exposure	Breathing zone monitoring with at least 10.0 eV PID; action level of 5 ppm sustained for over 1 minute. Medical clearance for hazardous waste work. 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Wash hands before eating or drinking. Nitrile gloves for chemical/contaminant contact. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling.
Well construction or abandonment	Being struck by vehicles.	Traffic control as in step 2.
	Particulate exposure	Visually monitor for dust and take action (wetting, etc.) to suppress if dust is visible in breathing zone.
	Unauthorized personnel in work zone	Unauthorized personnel controls as in step 2.
	Electric Shock	Portable electrical tools and all portable electrical equipment must be connected through ground fault circuit interrupters.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use/hotwork areas. Clear 30 ft radius area of combustible/flammable materials during hotwork. Treat all drains/wells as possible sources of combustible/flammable materials (CGI monitor and cover).
	Temperature Stress	Temperature stress controls as in step 2.
	Lifting (musculoskeletal injuries)	Lifting (musculoskeletal injuries) controls as in step 2.
	Chemical Exposure	Chemical hazard controls as in step 3.
Containing and managing soil cuttings, decon fluids, purge water and other IDW	Forklift	Documented forklift training for forklift operators and daily forklift inspections. Only experienced operators will be allowed to operate equipment. No personnel under lifted loads.
	Unauthorized personnel in work zone	Exclude non-site workers from work area using barrier tape.
	Temperature stress	Temperature stress controls as in step 2.

Job Steps	Potential Hazard	Critical Actions
	Lifting (musculoskeletal injuries)	Lifting (musculoskeletal injuries) controls as in step 2.
	Electric Shock	Portable electrical tools and all portable electrical equipment must be connected through ground fault circuit interrupters.
	Battery Fire/Explosion	Use only batteries that are not installed in vehicles and are not being charged during use for powering equipment. If no other battery available use vehicle battery by making the final connection away from the battery or using PTO.
	Exposure to chemicals	Chemical controls as in step 3
	IDW control	Label or mark IDW containers to indicate container number, contents (including physical state), investigation location, date of collection, and client name. Ensure that storage area provides adequate protection against physical damage or disturbance.

Activity Hazard Analysis		
Work Activity: Surface Soil Sampling		
Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	X	
Hard Hat	X	If overhead hazards
Safety Glasses With Side Shields	X	
Fire Resistant Clothing		
Face Shields		
Goggles		
Lifeline/Body Harness		
Hearing Protection	X	When within 25 feet of operating generators
Air Purifying Respirator		
Supplied Air Respirator – SCBA		
Welding Hood		
Welding/Pipe Clothing		
Welding Mask/Goggles		
Personal Floatation Device		If within 6 feet of unguarded water 3 feet or more in depth
Gloves	X	Nitrile or PVC for potentially contaminated material. Heavy duty work gloves for material handling. Leather for clearing vegetation
Other		
Safety Cones/Barricades	X	To control/alert traffic and exclude unauthorized personnel.
Safety Vest	X	If near active traffic areas
Knee Pads		
Caution/Danger Tape	X	As needed, to exclude unauthorized personnel

Job Steps	Potential Hazard	Critical Actions
Mobilize to work site	Traffic accident.	Compliance with EH&S Procedure 110, Vehicle Operation (valid drivers license, seat belt use, routine vehicle inspections, no cell phone use while driving).
Sampling	Being struck by vehicles.	Traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades (more substantial barriers required as traffic hazard increases). Vehicle(s) placed between workers and oncoming traffic. High visibility safety vests in traffic areas. Flashing rotating beacon in high traffic parking areas or brief roadwork. MUTCD compliant traffic control plan for work in road/street, roadside parking strip, sidewalk, shoulder. All required lane closure permits from local traffic control authority must be attached to individual site sheet for work in DOT right of way. Rig/fork truck equipped with functional back-up alarm. Artificial lighting provided for work after twilight.
	Contact with overhead structures or utilities.	FM will survey location and ensure absence of obstructions and overhead utilities prior to set-up. Personnel and equipment will not be allowed to come within 10 feet of overhead power lines.
	Contact with buried structures or utilities.	Pin flags will not be set deeper than 6 inches. Wooden or plastic steaks will be used if greater depth required. If penetrating more than 1 foot during sampling FM will clear area for underground utilities before work begins.
	Electric shock	Portable electrical tools and all portable electrical equipment must be connected through ground fault circuit interrupters.
	Noise	Hearing protection required within 25 feet of operating gasoline powered generators or while using chain saws/trimmers
	Flying debris	Safety glasses with face shield required when operating chainsaw/trimmers.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use areas. Allow gasoline-powered equipment to cool prior to fueling.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.
	Lifting (musculoskeletal injuries) hazards.	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.

Job Steps	Potential Hazard	Critical Actions
	Hazardous energy	If hazardous energy emissions are possible establish an exclusion zone boundary that unauthorized personnel cannot cross. Only qualified experienced personnel are authorized to perform all maintenance and operation. Exercise caution around all operating equipment. Inspect equipment prior to each shift to ensure all safety systems are in place and operational. Insure all equipment is completely secured, de-energized, and de-pressurized before initiating any maintenance activities. Replace all guards and secure all equipment panels prior to operation.
	Chemical exposure	If contaminants are present at the surface interval - 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Medical clearance for hazardous waste work. Nitrile gloves for chemical/contaminant contact. Wash hands before eating or drinking. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling

Activity Hazard Analysis		
Work Activity: Opening pavement by jackhammer or powered saw		
Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	X	
Hard Hat	X	Within 25 feet of overhead hazards
Safety Glasses With Side Shields	X	
Fire Resistant Clothing		
Face Shields	X	If jackhammering or pavement saw cutting
Goggles		
Lifeline/Body Harness		
Hearing Protection	X	When within 25 feet of jackhammer, compressor, or saw
Air Purifying Respirator	X	If dust suppression methods not used
Supplied Air Respirator – SCBA		
Welding Hood		
Welding/Pipe Clothing		
Welding Mask/Goggles		
Personal Floatation Device		If within 6 feet of unguarded water 3 feet or more in depth
Gloves	X	Nitrile or PVC for potentially contaminated material. Heavy duty work gloves for material handling.
Other	X	At least 10.0 eV PID or equivalent monitor (calibration checked daily) during intrusive work that might generate hazardous airborne chemicals. Stop work if breathing zone readings exceed 5 ppm for more than 1 minute. CGI if combustible vapors possible above 100 ppm on PID.
Safety Cones/Barricades	X	To control/alert traffic and exclude unauthorized personnel.
Safety Vest	X	If near active traffic areas
Knee Pads		
Caution/Danger Tape	X	As needed, to exclude unauthorized personnel

Job Steps	Potential Hazard	Critical Actions
Mobilize to work site	Traffic accident.	Compliance with EH&S Procedure 110, Vehicle Operation (valid drivers license, seat belt use, routine vehicle inspections, no cell phone use while driving).
Set-up	Being struck by vehicles.	Traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades (more substantial barriers required as traffic hazard increases). Vehicle(s) placed between workers and oncoming traffic. High visibility safety vests in traffic areas. Flashing rotating beacon in high traffic parking areas or brief roadwork. MUTCD compliant traffic control plan for work in road/street, roadside parking strip, sidewalk, shoulder. All required lane closure permits from local traffic control authority must be attached to individual site sheet for work in DOT right of way. Rig/fork truck equipped with functional back-up alarm. Artificial lighting provided for work after twilight.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Lifting (musculoskeletal injuries) hazards.	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.
	Unauthorized personnel entering work zone	If structures or public access areas fall within radius of raised mast, establish a work schedule to minimize hazard to public, establish an exclusion zone boundary that unauthorized personnel can not cross.
Powered saw cutting of pavement	Struck by moving vehicles	Traffic controls as in step 2.
	Underground utilities	FM will ensure that each location has been cleared to preclude contact with buried utilities through compliance with EH&S Procedure 130.
	Temperature extremes	Temperature stress controls as in step 2.
	Flying debris	Face shield and safety glasses or full-face respirator required to protect face and eyes. Establish an exclusion zone to keep non-workers out of range of flying debris or erect barriers to prevent flying debris from leaving work zone.
	Musculoskeletal injuries	Musculoskeletal injuries controls as in step 2. Patience and smooth application of force will help prevent back/shoulder strain. Be aware of kickback and run-off when operating saw.

Job Steps	Potential Hazard	Critical Actions
	Chemical exposure	Breathing zone monitoring with at least 10.0 eV PID if free product potential exists; action level of 5 ppm sustained for over 1 minute. Medical clearance for hazardous waste work. 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Wash hands before eating or drinking. Nitrile gloves for chemical/contaminant contact. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling.
	Silica exposure	Use wetting to suppress concrete dust to prevent silica exposure. If wetting is not possible industrial ventilation may be used to prevent dust from entering worker breathing zone. If engineering controls not practicable disposable respirators may be used to control worker exposure. Medical release and fit test required for respirator use.
Jackhammer operation	Struck by moving vehicles	Traffic controls as in step 2.
	Pressurized systems	Only experienced operators. Jackhammer will have "dead-man" control. Jackhammer will be operated per subcontractor's standard procedures or per manufacturer's directions. All hoses and lines will be inspected daily. Fittings will be secured and lashed against whipping. Damaged or abraded pressure hoses that expose fiber reinforcing shall not be used. Electrical connections and cords shall be inspected prior to each use.
	Flying debris	Establish an exclusion zone to keep non-workers out of range of flying debris or erect barriers to prevent flying debris from leaving work zone. Face shield and safety glasses required for workers in exclusion zone.
	Unauthorized personnel entering work zone	Unauthorized controls as in step 2.
	Subsurface utilities (electric shock, fire, damage to utilities)	FM will ensure that each boring location has been cleared to preclude contact with buried utilities through compliance with EH&S Procedure 130.
	Noise	Hearing protection when within 25 ft unless equipment-specific monitoring indicates that noise levels are less than 85 decibels.
	Temperature Extremes	Temperature stress controls as in step 2.
	Lifting (musculoskeletal injuries) hazards	Lifting (musculoskeletal injuries) controls as in step 2.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use areas.
	Chemical exposure	Breathing zone monitoring with at least 10.0 eV PID if free product encountered; action level of 5 ppm sustained for over 1 minute. Medical clearance for hazardous waste work. 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Wash hands before eating or drinking. Nitrile gloves for chemical/contaminant contact. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling.

Job Steps	Potential Hazard	Critical Actions
	Silica exposure	Use wetting to suppress concrete dust to prevent silica exposure. If wetting is not possible industrial ventilation may be used to prevent dust from entering worker breathing zone. If engineering controls not practicable disposable respirators may be used to control worker exposure. Medical release and fit test required for respirator use.

Activity Hazard Analysis		
Work Activity: Non-intrusive physical and geophysical surveys		
Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	X	
Hard Hat	X	If overhead hazards
Safety Glasses With Side Shields	X	
Fire Resistant Clothing		
Face Shields		
Goggles		
Lifeline/Body Harness		
Hearing Protection	X	When within 25 feet of operating generators
Air Purifying Respirator		
Supplied Air Respirator – SCBA		
Welding Hood		
Welding/Pipe Clothing		
Welding Mask/Goggles		
Personal Floatation Device		If within 6 feet of unguarded water 3 feet or more in depth
Gloves	X	Nitrile or PVC for potentially contaminated material. Heavy duty work gloves for material handling. Leather for clearing vegetation
Other		
Safety Cones/Barricades	X	To control/alert traffic and exclude unauthorized personnel.
Safety Vest	X	If near active traffic areas
Knee Pads		
Caution/Danger Tape	X	As needed, to exclude unauthorized personnel

Job Steps	Potential Hazard	Critical Actions
Mobilize to work site	Traffic accident.	Compliance with EH&S Procedure 110, Vehicle Operation (valid drivers license, seat belt use, routine vehicle inspections, no cell phone use while driving).
Survey	Being struck by vehicles.	Traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades (more substantial barriers required as traffic hazard increases). Vehicle(s) placed between workers and oncoming traffic. High visibility safety vests in traffic areas. Flashing rotating beacon in high traffic parking areas or brief roadwork. MUTCD compliant traffic control plan for work in road/street, roadside parking strip, sidewalk, shoulder. All required lane closure permits from local traffic control authority must be attached to individual site sheet for work in DOT right of way. Rig/fork truck equipped with functional back-up alarm. Artificial lighting provided for work after twilight.
	Electric shock	Portable electrical tools and all portable electrical equipment must be connected through ground fault circuit interrupters.
	Battery Fire/Explosion	Use only batteries that are not installed in vehicles and are not being charged during use for powering equipment. If no other battery available use vehicle battery by making the final connection away from the battery or using PTO.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel use areas. Allow gasoline-powered equipment to cool prior to fueling.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Severe weather	Locate nearest severe weather shelter/strong structure before beginning fieldwork. Suspend fieldwork if lighting within 10 miles of site or tornado warning issued. Do not work in areas subject to flash flooding (arroyo, ditch, etc.) if rain is forecast in immediate area or upstream of site.
	Lifting (musculoskeletal injuries) hazards.	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.
	Hazardous energy	If hazardous energy emissions are possible establish an exclusion zone boundary that unauthorized personnel cannot cross. Only qualified experienced personnel are authorized to perform all maintenance and operation. Exercise caution around all operating equipment. Inspect equipment prior to each shift to ensure all safety systems are in place and operational. Insure all equipment is completely secured, de-energized, and de-pressurized before initiating any maintenance activities. Replace all guards and secure all equipment panels prior to operation.

Job Steps	Potential Hazard	Critical Actions
	Chemical exposure	If contaminants are present at the surface - 40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Medical clearance for hazardous waste work. Nitrile gloves for chemical/contaminant contact. Wash hands before eating or drinking. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling
	Biological hazards	Inspect area for hazardous plants and organism conditions. Avoid such areas if possible. Wear clothing that covers potentially affected body parts. Seal pants legs against contact with plants and to prevent access by organisms. Use insect/tick repellant whenever possible. Wear snake chaps if poisonous snake habitat is to be entered (underbrush, high grass, rubble/loose rock). Review route to hospital if in snake habitat or allergic to insect/spider sting/bite. Do not touch face before thoroughly washing hands with detergent if working in poison ivy/oak/sumac.

Activity Hazard Analysis		
Work Activity: Equipment decontamination		
Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	X	
Hard Hat		
Safety Glasses With Side Shields	X	
Fire Resistant Clothing		
Face Shields	X	When pressure washing
Goggles	X	For splash protection
Lifeline/Body Harness		
Hearing Protection	X	Near pressure washer or generator
Air Purifying Respirator		
Supplied Air Respirator – SCBA		
Welding Hood		
Welding/Pipe Clothing		
Welding Mask/Goggles		
Personal Floatation Device		
Gloves	X	Nitrile or similar for potentially contaminated material. Heavy duty work gloves for material handling.
Other		
Safety Cones/Barricades	X	As necessary, to control/alert traffic and exclude unauthorized personnel
Safety Vest	X	As necessary for traffic safety
Knee Pads		
Caution Tape	X	As needed, to exclude unauthorized personnel

Job Steps	Potential Hazard	Critical Actions
Mobilize to work site	Traffic accident.	Compliance with EH&S Procedure 110, Vehicle Operation (valid drivers license, seat belt use, routine vehicle inspections, no cell phone use while driving).
Equipment decontamination by washing and water rinse	Being struck by vehicles.	As necessary, traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades. Vehicle(s) placed between workers and oncoming traffic.
	Lifting (muskuloskeletal injury)	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Electric shock.	Portable electrical tools and all portable electrical equipment must be connected through ground fault circuit interrupters.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel/flammable liquid use areas.
	Chemical exposure	40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Medical clearance for hazardous waste work. Nitrile gloves for chemical/contaminant contact. Wash hands before eating or drinking. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling.
	IDW Control	Label or mark IDW containers to indicate container number, contents (including physical state), investigation location, date of collection, and client name. Ensure that storage area provides adequate protection against physical damage or disturbance.
Equipment decontamination by steam/pressure washer	Being struck by vehicles.	As necessary, traffic control by 36" + tall traffic cones, barricade tape, and/or sawhorse barricades. Vehicle(s) placed between workers and oncoming traffic.
	Lifting (muskuloskeletal injury)	Compliance with EH&S Procedure 150, Manual Lifting. If equipment is to be moved, an evaluation of potential pinch points and/or weight strain will be conducted. Clear area of all unnecessary equipment and slip/trip hazards. Additional help will be obtained by workers or mechanical assistance used on-site if equipment to be moved is unwieldy, has a weight >50 lbs or has to be moved by maneuvering through awkward positioning.
	Cuts/Water Jet cuts	Heavy gloves required while handling steam/pressure washer wand. Keep body parts clear of wand nozzle. Wear heavy water proof apron or rain suite.
	Scald/Burns	Allow heated components to cool prior to handling/servicing. Keep clear of steam cleaner nozzle.

Job Steps	Potential Hazard	Critical Actions
	Eye injury	Goggles or safety glasses with face shield required for wand handling. Coat with anti-fog treatment before use.
	Temperature stress.	If temperature is above 80°F or below 40°F, administrative controls will be implemented (cooled or warmed drinks, routine breaks in heated or shaded area, provisions for emergency heating or cooling).
	Electric shock.	Portable electrical tools and all portable electrical equipment must be connected through ground fault circuit interrupters.
	Fire	Fire extinguisher rated 2A and 5B (serviced annually and inspected monthly) in all fuel/flammable liquid use areas.
	Chemical exposure	40hr HAZWOPER and current refresher for workers. 8hr additional supervisor for FM, SSHO, and all other on-site supervisors. Medical clearance for hazardous waste work. Nitrile gloves for chemical/contaminant contact. Wash hands before eating or drinking. Chemical containers labeled with identity and hazard. MSDSs on site for all chemicals in use. Site-specific training must address chemicals, hazards, and proper handling.
	IDW Control	Label or mark IDW containers to indicate container number, contents (including physical state), investigation location, date of collection, and client name. Ensure that storage area provides adequate protection against physical damage or disturbance.

SITE MAP

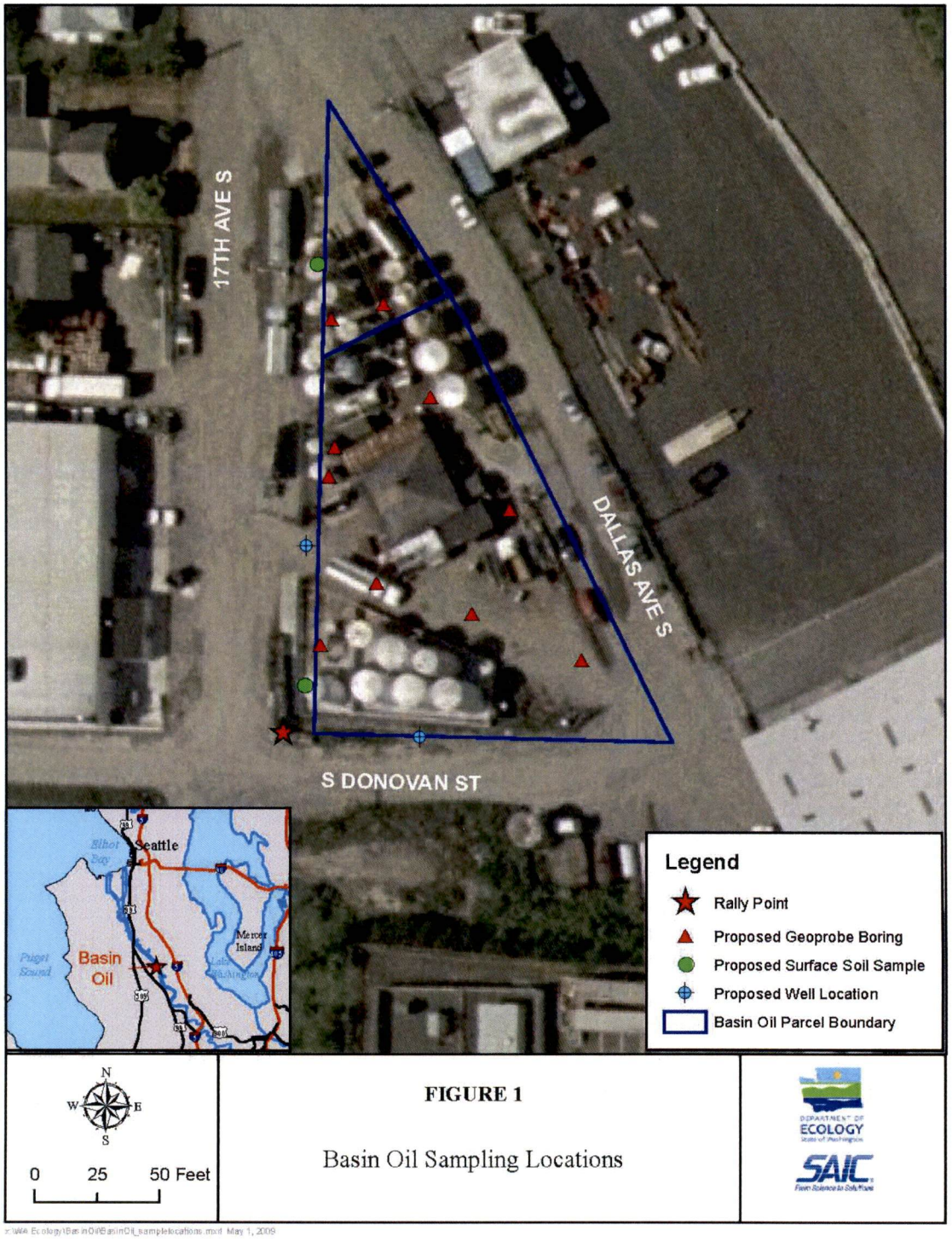


FIGURE 1

Basin Oil Sampling Locations

K:\WA Ecology\Basin Oil\BasinOil_samplelocations.mxd May 1, 2009

SAIC INCIDENT NOTIFICATION CONTACT LIST

NAME	POSITION	OFFICE PHONE	CELL PHONE
Steve Davis	H&S Manager	865-481-4767	865-414-9035
Doug Pearman	Program Manager	425-482-3307	206-200-7637
Glen Vedera	Project Manager	425-482-3329	206-271-4691
Gabriel Cisneros	FM/SHSO	425-482-3301	206-718-9799

Workers performing tasks under this project my come in contact with environmental media that have concentrations of site contaminants that may pose a risk of overexposure:

Gasoline **Synonyms & Trade Names** Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]	**CAS** 8006-61-9 **RTECS** LX3300000 **DOT ID & Guide** 1203 128

Exposure Limits	NIOSH REL: Ca See Appendix A
	OSHA PEL†: none
	ACGIH PEL: TLV 300 ppm STEL 500 ppm

IDLH Ca [N.D.] See: IDLH INDEX	**Conversion** 1 ppm 2.95 mg/m^3 (approx)

Physical Description
Clear liquid with a characteristic odor.

MW: 72 (approx)	BP: 102°F	FRZ: ?	Sol: Insoluble
VP: 38-300 mmHg	IP: ?		Sp.Gr(60°F): 0.72-0.76
Fl.P: -45°F	UEL: 7.6%	LEL: 1.4%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers such as peroxides, nitric acid & perchlorates

Measurement Methods OSHA PV2028 See: NMAM or OSHA Methods

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation Provide: Eyewash, Quick drench	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Important additional information about respirator selection
Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney cancer]

ARSENIC

ICSC: 0013

Grey arsenic
As
Atomic mass: 74.9

ICSC # 0013
CAS # 7440-38-2
RTECS # CG0525000
UN # 1558
EC # 033-001-00-X
October 18, 1999 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight when exposed to hot surfaces or flames in the form of fine powder or dust.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Cough. Sore throat. Shortness of breath. Weakness. See Ingestion.	Closed system and ventilation.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Diarrhoea. Nausea. Vomiting. Burning sensation in the throat and chest. Shock or collapse. Unconsciousness.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING

Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed.	Do not transport with food and feedstuffs. Marine pollutant. T symbol N symbol R: 23/25-50/53 S: 1/2-20/21-28-45-60-61 UN Hazard Class: 6.1 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0013	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ARSENIC

ICSC: 0013

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens, causing fire and explosion hazard. Reacts with acids to produce toxic arsine gas (see: ICSC 0222).

OCCUPATIONAL EXPOSURE LIMITS:
OSHA PEL: 1910.1018 TWA 0.010 mg/m^3
NIOSH REL: Ca C 0.002 mg/m^3 15-minute See Appendix A
NIOSH IDLH: Ca 5 mg/m^3 (as As) See: 7440382
TLV: 0.01 mg/m^3 as TWA; A1 (confirmed human carcinogen); BEI issued; (ACGIH 2004).
MAK:
Carcinogen category: 1; Germ cell mutagen group: 3A;
(DFG 2004).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes , the skin and the respiratory tract. The substance may cause effects on the gastrointestinal tract , cardiovascular system , central nervous system and kidneys , resulting in severe gastroenteritis, loss of fluid, and electrolytes, cardiac disorders , shock , convulsions and kidney impairment . Exposure above the OEL may result in death. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the mucous membranes, skin, peripheral nervous system , liver and bone marrow , resulting in pigmentation disorders, hyperkeratosis, perforation of nasal septum, neuropathy, liver impairment , and anemia . This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Sublimation point: 613°C
Density: 5.7 g/cm^3

Solubility in water:
none

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.

ACETONE

ICSC: 0087

2-Propanone
Dimethyl ketone
Methyl ketone
C_3H_6O / CH_3COCH_3
Molecular mass: 58.1

ICSC # 0087
CAS # 67-64-1
RTECS # AL3150000
UN # 1090
EC # 606-001-00-8
April 22, 1994 Validated
Fi, review at IHE: 10/09/89

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, alcohol-resistant foam, water in large amounts, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE			
•INHALATION	Sore throat. Cough. Confusion. Headache. Dizziness. Drowsiness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness. Pain. Blurred vision. Possible corneal damage.	Safety spectacles or face shield . Contact lenses should not be worn.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Nausea. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING

Personal protection: self-contained breathing apparatus. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Then wash away with plenty of water.	Fireproof. Separated from strong oxidants. Store in an area without drain or sewer access.	F symbol Xi symbol R: 11-36-66-67 S: 2-9-16-26 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0087	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ACETONE

ICSC: 0087

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air and may travel along the ground; distant ignition possible.

CHEMICAL DANGERS:
The substance can form explosive peroxides on contact with strong oxidants such as acetic acid, nitric acid, hydrogen peroxide. Reacts with chloroform and bromoform under basic conditions, causing fire and explosion hazard. Attacks plastic.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 500 ppm as TWA, 750 ppm as STEL; A4 (not classifiable as a human carcinogen); BEI issued; (ACGIH 2004).
MAK: 500 ppm 1200 mg/m³
Peak limitation category: I(2);
Pregnancy risk group: D;
(DFG 2006).
OSHA PEL†: TWA 1000 ppm (2400 mg/m^3)
NIOSH REL: TWA 250 ppm (590 mg/m^3)
NIOSH IDLH: 2500 ppm 10%LEL See: 67641

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and through the skin.

INHALATION RISK:
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

EFFECTS OF SHORT-TERM EXPOSURE:
The vapour irritates the eyes and the respiratory tract. The substance may cause effects on the central nervous system , liver , kidneys and gastrointestinal tract .

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the blood and bone marrow .

PHYSICAL PROPERTIES

Boiling point: 56°C
Melting point: -95°C
Relative density (water = 1): 0.8
Solubility in water:
miscible
Vapour pressure, kPa at 20°C: 24

Relative vapour density (air = 1): 2.0
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.2
Flash point: -18°C c.c.
Auto-ignition temperature: 465°C
Explosive limits, vol% in air: 2.2-13
Octanol/water partition coefficient as log Pow: -0.24

ENVIRONMENTAL DATA

NOTES

Use of alcoholic beverages enhances the harmful effect.

Transport Emergency Card: TEC (R)-30S1090

NFPA Code: H 1; F 3; R 0;
Card has been partially updated in July 2007: see Occupational Exposure Limits.

Card has been partially updated in January 2008: see Storage.

ADDITIONAL INFORMATION

Material Safety Data Sheets

- Bentonite
- Hydrochloric acid
- Isobutylene calibration gas
- Liquinox
- Methanol
- Sodium Bisulfate
- Nitric acid