SITE-SPECIFIC
HEALTH AND SAFETY PLAN

FORMER RIVERSIDE SCRAP IRON & METAL PROPERTY
2993 6th Street
Riverside, California 92507
Department of Toxic Substances Control Docket No HAS-FY21/22-032

Issued: August 15, 2023

Prepared for: **IRON LOFTS LLC**
1201 Dove Street, Suite 520
Newport Beach, California 92660

Prepared by: **GSI ENVIRONMENTAL INC.**
19200 Von Karman Avenue, Suite 800
Irvine, California 92612
949.679.1070
www.gsienv.com
GSI Project No. 6239

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Plan Revised By:	Konrad Grochocki	Date:	8/15/2023
Plan Reviewed By:	Samantha Curtis	Date:	8/15/2023

Approved By:

DRAFT (to be finalized prior to mobilization)

Samantha Curtis, PG
Senior Geologist

Site Specific Health and Safety Plan
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GSI PERSONNEL ACKNOWLEDGEMENT

I, the undersigned, have been provided with a copy of this Site-Specific Health and Safety Plan. I have read the Plan, have attended a project safety orientation session conducted by GSI Environmental Inc. (GSI), and have had the opportunity to ask questions about health and safety issues relating to this project. I understand that it is my responsibility to abide by this Plan, and that physical injury, damage and other harm to myself or others could result from my failure to do so.

Exhibit A: GSI Personnel Acknowledgement

Name (please print)	Signature	Date

_____***Non-GSI*** Personnel Present (use next page).

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NON-GSI PERSONNEL ACKNOWLEDGEMENT

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Exhibit B: Non-GSI Personnel Acknowledgement

Name (please print)	Company	Signature	Date

Note: Non-GSI personnel include, but not limited to, GSI-subcontractors, 3rd party subcontractors, clients, site representatives, and/or regulatory representatives.

1.0 SCOPE AND APPLICATION

This Site-Specific Health and Safety Plan (SS-HASP) has been prepared in accordance with 29 CFR §1910.120, 8 CCR 5192, and is a site-specific supplement to the GSI company Environmental, Health and Safety (EHS) Program Manual for Field Operations (the "EHS Program Manual"), which specifies GSI's general health and safety policies and procedures. This SS-HASP is to be provided to all site workers under the direction of GSI for their review. In addition, this SS-HASP, the GSI EHS Program Manual, and applicable client safety guidelines will remain on-site at all times during the project, and will be available to all project personnel upon request from the GSI Site Safety Officer (SSO) or other designated representative.

This SS-HASP specifies health and safety protocol to be followed during implementation of the project work scope by all site personnel under the direction of GSI, including employees and subcontractors. In the event of conflicting standards between this plan or the GSI EHS Program Manual and client health and safety requirements, the more protective standard shall apply. All personnel are required to comply with this SS-HASP and to indicate their agreement to do so by signing the cover page.

2.0 PROJECT DESCRIPTION

SITE IDENTIFICATION	
Name:	Former Riverside Scrap Iron and Metal
Address:	2993 6th Street
City:	Riverside
County:	Riverside
State:	California
Zip Code:	92507
Site Owner/Client:	Realm
Client Contact:	Todd Cadwell
Business Address:	1201 Dove Street, Suite 520, Newport Beach, CA 92660
Business Phone:	949.975.1122
Business Email:	tcadwell@realmre.com
Relevant Document:	Response Plan dated July 11, 2023

2.1 Site Description

The Site is approximately 7 acres in size and is identified as “light industrial” by the Riverside County Assessor’s Office (Figures 1 and 2). The Site was used as a scrap metal recycling yard for over 45 years and Site structures included a main office (Area 8a), a former machine shop (Area 8b), a storage building (Area 8d), and an office/maintenance building (Area 10a). The Site formerly maintained underground and aboveground storage tanks on the southwestern portion of the Site (Area 8e) that were used to store and dispense fuel and oil. Historical railroad operations were conducted in Areas 8f, 8g, and 12. The scrap metal and recycling business ceased operations in 2015. By August 2015, the Site had been cleared of utilities and most mixed trash, debris and scrap metal, and currently consists mostly of unpaved bare earth and paved surfaces with some remaining debris. Surrounding land uses to the north and west are primarily commercial. Residential housing is located along the eastern border of the Site and across Mission Inn Avenue to the south.

2.2 Project Description

Work will include the excavation and removal of the on-Site impacted surficial soil to a depth of approximately 1.0 to 2.5 feet bgs, followed by soil confirmation sampling. Impacted soil is present across approximately 5.5 acres of the Site. The expected volume of soil to be removed is approximately 20,000 cubic yards. Assuming 13 cubic yards of material per truckload, this would equate to approximately 1,500 one-way truck trips from the Project Site or approximately 43 truckloads leaving the Site per day over a period of 35 days. A similar volume of clean fill soil may be imported to the Site for grading.

A small portion of the total volume is highly impacted material that may be classified as RCRA waste, which requires special handling and is more costly to dispose. The remainder of the material may be classified as California hazardous waste or non-hazardous waste. The objective of this program is to remove soil impacted with COCs above residential criteria and dispose of it cost-effectively and safely. This will require a program of targeted removal followed by a broad Site-wide excavation plan. The off-Site residential areas will be excavated during the targeted on-Site excavation work and the impacted soil will be brought on-Site to be temporarily staged prior to off-Site disposal.

2.3 Project Tasks

This soil excavation and remediation project tasks will include the tasks described below.

2.3.1 Geophysical Utility Survey and Underground Services Alert Notification

Prior to initiation of soil sampling activities, GSI will mark sampling locations and notify Underground Services Alert (USA) regarding the planned sampling and excavation activities at the Site. USA will contact utility owners of record within the vicinity of the Site to notify them of the intention to conduct drilling activities in proximity to buried utilities. The utility owners of record, or their designated agents, will mark the position of their utilities on the ground surface.

2.3.2 Soil Removal and Confirmation Sample Collection

Under the direction of GSI, shallow soil impacted with PCBs, lead, and arsenic will be excavated using a backhoe excavator and stockpiled for off-Site disposal. Excavation depths will range between 1 to 5 feet bgs (Figures 3A, 3B, 3C, 3D, and 4). The extent of proposed excavations has approximately been defined from previous subsurface soil sampling performed at the Site. Excavated soil will be stockpiled on-Site and characterized for disposal in general accordance with Chapter 9 of USEPA publication SW-846, Test Methods for Evaluation Solid Waste, Physical/Chemical Methods (SW-846). Excavated soils will be placed on and covered with plastic sheeting until transported to an off-Site disposal facility under manifest. If soil exhibiting odors or staining is encountered, soil will be segregated/stockpiled for subsequent characterization and off-Site disposal, as applicable, based on soil disposition planning by the contractor.

Following completion of excavation activities, confirmation soil samples will be collected from the base of the soil removal zone in a large grid pattern with samples representing every 60 feet in both lateral directions (one sample per 3,600 sq feet; Figure 4). Confirmation soil samples will be collected across the Site by an on-Site geologist using manual or direct push sampling methods in appropriate sampling containers and stored on ice, prior to delivery to a DHS-certified laboratory for analysis of Title 22 (CAM-17) metals, PCBs and PAHs, and for TPH in TPH removal areas. The samples will be analyzed using the same methodology as the samples collected during the previous subsurface investigation. This will include metals by EPA Method 6010B, PCBs by EPA Method 8082 after the required Soxhlet Extraction Method (EPA Method 3541), and PAH by EPA Method 8270M (selective on monitoring).

2.3.3 Soil Vapor Probe Installation and Sampling

Dual-nested soil vapor wells consisting of two soil vapor probes and triple-nested soil vapor wells consisting of three soil vapor probes are proposed for installation at the Site. Each soil vapor probe location will be manually cleared to approximately 5 feet bgs using a hand auger. Direct push technology will be utilized to advance the boring from 5 feet bgs to the final borehole depths of approximately 15 and 30 feet bgs. The dual and triple-nested wells will be installed as semi-permanent, with soil vapor probes set at depths of 5, 15, and 30 feet. The soil vapor probe depths may be adjusted in the field based on observation of soil properties and/or limitations during drilling to target coarse-grained soils that allow for soil vapor flow.

The dual and triple-nested soil vapor probes will be constructed using nominal ¼-inch diameter Nylaflow tubing connected to a porous polyethylene soil vapor sample probe, set within approximately 1 foot of #3 sand placed around the sample probe. A dry bentonite seal (at least 6 inches) and a cement and bentonite grout seal will be placed on top of the sand pack to the ground surface. The tubing will be capped with a vapor-tight two-way valve or cap at the surface to eliminate the potential for barometric pressure fluctuations inducing vapor transport between

the subsurface and the atmosphere. The two-way valve or cap will be installed in the closed position and will allow equilibration of soil vapor concentrations immediately after installation.

The tubing will be properly marked at the surface to identify the probe location and depth (in addition to labeling the probes, the 30-foot probe tubing length will be the longest at the surface and the 5-foot probe tubing length will be the shortest at the surface).

Soil samples will be collected at approximately 5-foot intervals during drilling. At each soil vapor sample location, the recovered soil core will be screened for organic vapors using a photoionization detector (PID). If elevated PID readings or stained soil is observed, a soil sample will be collected for analysis for VOCs using USEPA Method 8260B and TPH using USEPA Method 8015.

Soil vapor samples will be collected after an equilibration time of at least 48 hours following installation. Prior to the commencement of sampling, shut-in tests will be conducted on the soil vapor probes. The probe heads will be attached to the sampling train assembly of tubing, valves, and fittings and connected to a purge pump. A minimum vacuum of 100 inches of water column (W.C.) will be applied to the sealed sampling train and monitored for at least 1 minute. After a successful shut-in test is completed, the soil vapor probe and sampling train will be purged. A total of 3 purge volumes will be removed from soil vapor probes prior to sampling. Each soil vapor probe will be purged at a rate of 200 milliliters per minute (mL/min) or less and at a vacuum less than of 100 inches W.C. One purge volume is equal to the internal sample tubing volume and volume of stagnant air within the sand pack and dry bentonite layers (assuming 40 percent porosity). During purging and sampling, 1,1-difluoroethane (DFA) will be applied as a leak-check tracer gas to check for ambient air leaks near above ground probe tubing and sampling train.

Following the completion of purging, soil vapor samples will be collected into the Summa canisters through the flow controller at a rate of approximately 200 mL/min. Duplicate soil vapor samples will be collected at a frequency of one per day or using a split-t manifold. In addition, one field quality assurance/quality control sample consisting of an ambient-air blank will be collected by drawing ambient air into a Summa canister through an attached sampling train.

Soil vapor samples will be analyzed for VOCs using USEPA Method TO-15.

2.3.4 Waste Disposal

Decontamination rinse water will be containerized separately for subsequent characterization and disposal at an authorized off-Site facility in accordance with applicable regulations. GSI will assist the client to coordinate disposal of the waste at an appropriate waste facility. Soil cuttings will be left on Site pending Site excavation and subsequent disposal.

3.0 EMERGENCY RESPONSE PROCEDURES

Specify emergency reporting contact. Provide Plant Emergency Response Contact with phone number(s) where applicable. Call 911 for emergencies located elsewhere.

3.1 Emergency Contacts

Exhibit 3.1: Emergency Contacts

Position	Company	Name	Cell Phone
GSI Project Team Leader (PTL)	GSI	Samantha Curtis	(949) 679-1070 (949) 870-6820 (cell)
GSI Site Manager	GSI	Konrad Grochocki	(224) 234-9491
GSI Site-Safety Officer (SSO)	GSI	Taiam Novin	(949) 412-6217
Client Project Manager	Realm	Todd Cadwell	(949) 975-1122
Client H&S Representative	Realm	Todd Cadwell	(949) 975-1122
Subcontractor Foreman			

3.2 Site Siren or Alarm Signals

No site-specific training is necessary on site. The site does not have any specific alarm signals.

3.3 Emergency Assembly Area(s) and Evacuation Route

In case of an emergency, assemble on the corner of 6th Street and Commerce Street located along the western portion of the Site towards the south.

3.4 Applicable Emergency Response Measures and Facilities

These measures include decontamination and/or medical treatment if necessary.

In case of an emergency, call 911.

Exhibit 3.4: Emergency Facilities

Facilty	Phone	Address	Directions
Riverside Community Hospital located 1.5 miles from the site (approximately 8-minute drive time). **Figure 5**	Emergency (951) 788-3200 Hospital (951) 788-3000	4445 Magnolia Avenue, Riverside, CA 92501	1. Head northwest on 6th St toward Commerce St; 2. Turn left onto Commerce St; 3. Turn right onto Howard Ave; 4. Turn right onto 14th St 5. Turn left onto Magnolia Ave and your destination will be on the left
Concentra Urgent Care located approximately 2.1 miles from the site (approximately 5-minute drive time) **Figure 6**	(951) 781-2200	1760 Chicago Avenue, Suite J3, Riverside, CA 92507	1. Head northwest on 6th St toward Commerce St; 2. Turn right onto Commerce St; 3. Turn right onto Third St; 4. Turn left onto Chicago Ave and your destination will be on the right

4.0 PROJECT ORGANIZATION, PERSONNEL, & TRAINING REQUIREMENTS

Key personnel are listed in Section 3.1, Emergency Contacts.

4.1 Training Requirements

Check all that apply and list any additional.

X	OSHA 40-hr HAZWOPER
	Contractor Safety Council (CSC) –Basic +
	Site-Specific (CSC or on-site)
	Unit-Specific
X	OSHA 8-hr Annual Refresher
	TWIC Card

4.2 Requirements for Respirator Use

Will respirator use potentially be required? __Yes X No

If yes, GSI Respiratory Protection Plan, found in Section 7.0 of the GSI EHS Program Manual, is applicable. Affected personnel must have physician's written opinion certifying fitness to use respirator based on pulmonary function test and other considerations, be trained in proper respirator use, and have quantitative fit test.

4.3 Personnel Documents

List documentation of training or medical fitness project personnel will be required to provide.

All field project personnel, including subcontractors, are to maintain training and medical records at their respective offices and provide to GSI, if requested. OSHA 40-hour HAZWOPER training with 8-hour refresher courses is required of all field personnel.

4.4 Excavation Contractor Health and Safety

The excavation contractor will develop their own Site-specific HASP for work conducted at the Site as required pursuant to the regulations in 29 CFR Part 1910.120 and California Code of Regulations (CCR), Title 8, Section 5192. The HASP will be prepared for the work described in the RAP and will include the details regarding physical and chemical hazards that could be encountered at the Site. The HASP will address the safety and health hazards of each activity in the removal design, including the requirements and procedures for worker protection. The implementation of the HASP is the responsibility of the excavation contractors designated Site Health and Safety Officer.

5.0 POTENTIAL HAZARDS AND HAZARD CONTROL MEASURES

The following sections discuss potential hazards at the Site and how to control them.

5.1 General Site Access Control Measures

Specify site control measures as necessary to prevent unauthorized persons from entering work area (e.g., fencing, barricades, tape, signs, etc.)

Traffic cones will be placed around heavy equipment to prevent unauthorized persons from entering the work area. If necessary, caution tape will be put around the work area to demarcate an area where unauthorized personnel are not allowed to enter. The GSI Site Safety Officer will be responsible for preventing unauthorized persons from entering the work area.

5.2 Project Personnel Access Control

Specify sign-in and sign out procedures for project personnel and means of notifying site manager if unable to be on-site.

Personnel must sign in and out every day with the GSI Site Safety Officer.

5.3 Underground Utilities Clearance

Specify procedures for obtaining clearance of locations for drilling, excavation, or other subsurface penetrations. If using a system such as the Texas 811 System or accessing the Portal at https://txgc.texas811.org/geocall/portal/, a 72-hour notice prior to start-up is required. Specify date of call, response and case or serial no. For clearance of site-owned utilities, provide contact and response information. Include a copy of any emails or other notifications of clearance at the end of this SS-HASP.

Utility clearance will include at least a 48-hour notification to Underground Service Alert (USA) of California, the state underground utility notification authority.

Below are the color designations typically used by the underground utilities' surveyors in Texas and California (note other states may differ):

Exhibit 5.3: Utility Color Designations

WHITE – PROPOSED EXCAVATION
PINK – TEMPORARY SURVEY MARKINGS
RED – ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES
YELLOW – GAS, OIL, STEAM, PETROLEUM OR GASEOUS MATERIALS
ORANGE – COMMUNICATION, ALARM OR SIGNAL LINES, CABLES OR CONDUIT
BLUE – POTABLE WATER
PURPLE – RECLAIMED WATER, IRRIGATION AND SLURRY LINES
GREEN – SEWERS AND DRAIN LINES

5.4 General Work Hazards and Avoidance

General work hazards include slip, trip, and fall hazards, head or foot injuries from falling or dropped objects, strains from over-exertion or incorrect lifting, electrical shocks, etc. These

hazards can be controlled by good housekeeping measures and safe work practices, as outlined below. See also GSI EHS Program Manual.

5.4.1 Housekeeping Measures

- Excess brush or high vegetation should be cleared from the work area to the extent practical prior to start of the job.
- The job site must be kept clean and free of trash and debris. Trash will be placed in bags or other suitable containers when generated. Disposable PPE must be disposed in designated containers upon removal.
- Materials such as lumber, well screen and riser pipe, filter pack sand, cement, etc. will be neatly stored in a designated area.
- Tools and equipment must be returned to the tool box or designated area when no longer in use.

5.4.2 General Safe Work Practices

- Use buddy system.
- Stay alert at all times to activities in your surroundings. Watch for on-coming vehicles, other workers, and overhead hazards.
- Work at a deliberate pace; do not rush a job.
- Avoid heavy lifting and lift with knees bent.
- Use tools only for their intended use, and make sure tools are in good condition. Inspect power tool and extension cords prior to use.
- Maintain safe distance (at least 10 feet and an additional 4 inches for every 10 kilovolts (kV) over 50 kV) between drill rig mast or other overhead equipment and overhead lines.
- Avoid unauthorized entry to restricted areas including confined space areas.
- Do not operate plant process equipment; do not open or close valves
- Proper PPE (specified below) must be worn at all times. PPE must be inspected regularly and properly maintained.
- Remove gloves and wash hands before handling food or tobacco products.

5.4.3 Fire and Explosion Hazard Mitigation

- All drilling or excavation locations must be properly cleared for the presence of underground utilities prior to drilling or digging. (Utility clearance procedures are specified above).
- Gasoline and other fuels must be stored in steel safety cans with mesh flame arresters and spring-mounted relief vent mechanisms. Flammable and combustible materials including paints and solvents must be properly stored away from sources of ignition.
- Fire extinguishers must be present on all vehicles and drilling and excavation equipment, and in all areas where spark producing equipment is in use.

5.4.4 Other Measures (check as applicable)

____ Smoking not permitted on-site, or
____ Smoking permitted only in designated areas
____ Matches and lighters not permitted on-site
____ Hot-work permits must be obtained for spark-producing equipment in designated areas
____ Other _____

5.4.5 Heat-Related Disorders

The major varieties of heat-related disorders, their related symptoms and appropriate treatment are listed below in order of increasing severity.

Exhibit 5.4.5a: Heat Related Disorders

Condition & Related Symptoms	Heat Stress	Heat Exhaustion or Heat Syncope	Heat Stroke
Cramping	May be present	May be present	Absent
Mental State	Faint, dizzy, fatigue	May be disoriented	Stupor or coma
Skin & Complexion	Cool, moist, flush; rash may be present.	Cool, pale, moist	Red, hot, dry
Temperature	Normal	Normal to low	Very high (>105° F)
Pulse	Rapid (>110 beat /min)	Rapid, weak	Rapid, bounding
Blood Pressure	May be low	May be low	May be high in early stages
Treatment	Give water & electrolytes, loosen or remove clothing, move to shade	Give water & electrolytes, loosen or remove clothing, move to shade	Provide rapid cooling by immersion; cover in wet cloth and transport to emergency room

Prevention Measures: All heat disorders are caused by loss of fluids and the body's inability to cool itself. Heat stress can be prevented by the following measures:

- Pre-hydrate before going into the field: water or water-electrolyte drinks are preferable to caffeinated beverages or soft drinks. Refrain from alcohol the night before field work.
- In the field drink frequently. Numerous small drinks at a tepid temperature are better than rapid, large volume intakes of iced drinks.
- Rest at least a few minutes every hour or two.
- Observe co-workers for signs of heat stress.

OSHA identifies the following Risk Levels for given values of the heat index and recommends increasing Protective Measures to be implemented at each level.

Exhibit 5.4.5b: Heat Risk Levels

Heat Index	Risk Level	Protective Measures
< 91° F	Lower (Caution)	Basic heat safety and planning
91° to 103° F	Moderate	Implement precautions and heighten awareness
103° to 115° F	High	Additional precautions to protect workers
> 115° F	Very High to Extreme	Aggressive measures (e.g., reschedule non-essential work)

5.4.6 Heavy Equipment Operations

Drilling and other equipment must be in good condition. Particular attention should be paid to the condition of cables and hoisting equipment. The equipment must be equipped with a back-up beeper. Barricades or caution tape should be used as needed to exclude unauthorized personnel from the work area.

All heavy equipment must employ the warning methods while the vehicle is backing up, as described in 8 CCR 1592, including:

- Automatic back-up alarm;
- Automatic braking device;
- A spotter directing the vehicle;

- Inspection of the entire perimeter of the vehicle prior to backing up; and/or
- Prohibiting foot traffic in the work area.

During drilling, the drill rig should be positioned to allow for adequate work room and the area kept free of trip and slip hazards. Care must be taken to avoid the catching of loose clothing in moving parts, and to keep hands free of pinch points. Proper PPE including hard hat, safety glasses, gloves, hearing protection, and safety shoes must be worn.

All vehicles or mechanical equipment that may have all or parts of its structure near energized overhead lines should maintain an operating distance of at least 10 feet of clearance with distance increased by 4 inches for every 10 kV over 50kV.

5.4.7 Confined Space and Excavation Safety

All personnel must obey all posted restrictions on entry to confined spaces. Excavations deeper than 4 ft should not be entered for any purpose unless 1) the excavation walls are properly shored or are sloped at a 1:1 slope, or less steep, and there is no danger of collapse or engulfment; 2) a suitable means of egress such as ramp, stairs or ladder is located so as to require no more than 25 ft of lateral travel to reach it; and 3) testing demonstrates a hazardous atmosphere is not present.

5.4.8 COVID-19

Due to the outbreak of the novel Coronavirus Disease 2019 (COVID-19), GSI's Pandemic Disease Plan (Addendum) will be implemented for GSI employees and subcontractors, which reflect the latest Centers for Disease Control (CDC) recommendations as well as requirements under California Code of Regulations (CCR) Title 8 Rule 3205. Below is a list of hazard mitigation measures that may be implemented:

- GSI employees and subcontractors shall monitor their health and remain home if feeling unwell (sick).
- Face masks are no longer a requirement, but the Los Angeles County Public Health Agency recommends the use of face masks to be worn in indoor settings when social distancing (separation of 6 feet or more) is not attainable. Therefore, GSI staff and subcontractors may wear face coverings when they see fit.
- GSI staff and subcontractors shall wash hands with soap and water, or use hand sanitizer, prior to consuming food, after sneezing, etc.

5.4.9 Potential Chemical Exposure Hazards

Summarize primary constituents of concern, relevant exposure levels, and the maximum expected concentrations in soil and/or groundwater, to the extent known. Provide Safety Data Sheets (SDSs) in Attachment A.

Exhibit 5.4.8: Chemical Exposure Hazard Levels

Constituents of Concern (COCs)	Exposure Limits[1]			I.P.[3]	Max. Expected Concentration or Free-Phase (FP)		Health Hazard Target Organ Route of Entry
Chemical Name/ CAS No.	PEL/TLV (ppm)	STEL (ppm)	IDLH[2] (ppm)	(eV)	Soil (mg/kg)	Water (mg/L)	
PCE [127-18-4]	25	100	150	9.32	0.002 mg/L	NA	Ca, Inh, Abs, Ing, Con
TCE [79-01-6]	10	25	1,000	9.45	0.00057 mg/L	NA	Ca, Inh, Abs, Ing, Con
Lead [7439-92-1]	0.05 mg/m^3	NA	100 mg/m^3	NA	4,260	NA	Inh, Ing, Con
PCBs [11097-69-1]	0.5 mg/m^3	NA	5 mg/m^3	NA	2600	NA	Inh, Abs, Ing, Con
Arsenic [7440-38-2]	0.01 mg/m^3	NA	5 mg/m^3	NA	166	NA	Inh, Abs, Ing, Con

Ca = Carcinogen
Abs = Skin Absorption
Con = Skin or Eye Contact
Inh = Inhalation
Ing = Ingestion
Unless otherwise

1 Permissible Exposure Limits (PEL) and Threshold Limit Values (TLVs) are permissible time-weighted average exposure limits (ppm in air), which must not be exceeded for an 8-hour work-day/40-hour work week. Short-Term Exposure Limits (STELs) must not be exceeded over a 15-minute period.
2 IDLH = Immediately Dangerous to Life or Health; must not be exceeded at any time.
3 I.P. = Ionization Potential. A photoionization detector specified in Section 6.0 should have a lamp with an IP (i.e. 10.6 eV or 11.7 eV) that is greater than the largest IP of COCs from this table that may reasonably be expected to occur as volatiles.
4 NPV = No published value; ND = Not determined.
5 Exposure limits, ionization potentials, and associated health hazards can be found in the NIOSH Pocket Guide to Chemical Hazards and the ACGIH Guide to TLVs and BEIs and Cal-OSHA 8 CCR 5155 Table AC-1.

To minimize potential chemical exposure, the following measures will be taken:

- SDS must be provided for any chemical brought on-site for project use.
- Workers should remain upwind of contaminated materials to the extent practical.
- PPE specified below will be worn prevent skin or eye contact with chemical constituents.
- Air quality monitoring will be conducted and respiratory protective equipment used as needed, as described below.
- Eating, drinking, smoking, gum chewing and oral tobacco use are not permitted in areas where chemical exposure could occur.
- Workers must remove gloves in the work area and drink from a water source outside the immediate work zone.
- PPE must be removed and hands thoroughly washed prior to breaking for meals.

5.4.10 Other Potential Hazards

List other potential hazards associated with the site and/or specific tasks and describe hazard mitigation methods.

During drilling and soil excavation, make sure proper PPE (level D) is worn (hard hat, steel-toe boots with appropriate traction, safety glasses, gloves, ear protection). Drilling at the Site is within an unpaved scrap yard. Make sure there is plenty of space for the heavy equipment to work.

During drilling and excavation activities, air monitoring will be conducted using a PID to measure for potential VOC emissions in accordance with SCAQMD Rule 1166. A direct reading PDR-1000 personal dust monitor or equivalent will be used to monitor for airborne particulates during soil excavation in the work zone.

Dust may be generated during excavation activities. The SCAQMD generally prohibits visible dust emissions beyond property lines as defined in Rule 403. When earthwork activities occur, dust control measures will be implemented to minimize dust generation. General dust control measures will include:

- sprinkling water to maintain soil moisture during excavation and loading activities;
- covering all trucks hauling soil, sand or other loose materials and require all trucks to maintain at least 2 feet of freeboard (trucks hauling soil off Site must secure the load in accordance with California and United States Departments of Transportation regulations);
- sweeping streets daily if visible soil material is carried onto adjacent public streets;
- restricting non-essential traffic in the project area;
- minimizing drop heights while loading transportation vehicles; and
- covering exposed affected soil or stockpiles with secured plastic sheeting.

To prevent heat-related illness, take frequent breaks and drink plenty of fluids throughout the day, and apply sunscreen.

6.0 AIR QUALITY MONITORING

Air quality monitoring will be performed by the SSO to 1) screen recovered soil and 2) monitoring air quality in work areas.

Dust from the removal activity may contain all the COCs such as the PCBs, PAHs, arsenic and lead. Control and monitoring measures will be implemented at the Site to reduce the potential for dust inhalation. During the removal action the SSO will monitor the workspace for total air borne particulates. Dust and air monitoring will be done in compliance with applicable South Coast Air Quality Management District (SCAQMD) Regulations.

General information related to SCAQMD Rules 1166 and 1466 have been included herein. The provisions and permitting requirements of Rule 1166 and 1466 will be the responsibility of the excavation contractor selected for the project and details of their air monitoring program will be included in their HASP.

6.1 Air Monitoring Instrument

X Photoionization Detector (PID) MiniRAE 3000 or equivalent (lamp - 10.6 eV)

_____ Drager Tube (specify compound & use) _____

_____ Personal Badges (specify compound & use) _____

_____ Lower Explosive Level (LEL) Meter _____

6.2 Monitoring Frequency and Location

6.2.1 SCAQMD Rule 1166

The contractor will abide by the provisions of SCAQMD Rule 1166. Rule 1166 applies to any operator conducting earth-moving activities in known or suspected volatile organic compound (VOC)-impacted soils.

- A PID will be used to screen recovered soil and monitor worker's breathing zone for VOCs during soil sampling at least once every 15 minutes during excavation or grading and record the results of sampling.
- In the event that sustained levels (1 minute) of 5 ppm in measured vapors are detected in the breathing zone, stop work and notify the SSO. Adjustments to the field practice such as ventilation and engineering controls will be implemented as needed prior to returning to the field activities.

6.2.2 SCAQMD Rule 1466

The contractor will abide by the provisions of SCAQMD Rule 1466 (Attachment 2). Rule 1466 applies to any operator conducting earth-moving activities at a Site with soil with toxic air contaminants of concern, which include Site COCs lead, arsenic, and PCBs.

- A SCAQMD pre-approved PM_{10} dust monitor[2] will be utilized at the Site for ambient monitoring.
- When earth-moving activities or vehicular movement occurs, the owner or operator will conduct continuous direct-reading near real-time ambient monitoring of PM_{10} concentrations.

- A minimum of one upwind monitor will be installed where the location of the upwind monitor(s) are indicative of background PM_{10} levels and not generally influenced by fugitive dust sources from the Site.

7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Only Level D PPE will be required for this project.

7.1 Level D PPE

A minimum of Level D PPE is required for all site personnel at all times, upgraded as necessary depending on task and conditions.

Basic Level D PPE shall include the following elements:

1) Hard Hat (w/ mono goggles)
2) Safety Glasses (w/side shields)
3) Safety Shoes (w/steel toes)
4) Body Covering (long pants, shirt w/ sleeves, collar)

Basic Level D equipment will be supplemented as described in the following section.

7.2 Supplemental Level D PPE

Needed	Item	When/Where to be Used
	Flame Retardant Clothing (FRC)	
X	Hearing Protection	When using heavy equipment or if standing in the vicinity of heavy equipment
X	Work gloves	While handling equipment (e.g. cut resistant)
	Latex or vinyl surgical gloves	
X	Neoprene or Nitrile gloves	While handling samples or sampling equipment
	Tyvek Coveralls	
	Polycoat Tyvek Coveralls	
	Chemical-resistant boots	
	Face Shield	
X	Reflective High Visibility Vest	While on Site

7.3 Level C PPE

No Level C work is expected to be performed on this project.

7.4 Level B PPE

No Level B work is expected to be performed on this project.

8.0 DECONTAMINATION PROTOCOL

Specify procedures for personnel decontamination and management of disposable PPE.

Disposable soil sampling equipment (soil core tubing, tape, etc.) will be disposed appropriately. Drilling and other SV probe installation equipment will be decontaminated by subcontractor. Decontamination rinse water will be containerized separately for subsequent characterization and disposal at an authorized off-Site facility in accordance with applicable regulations. Soil cuttings will be left on Site pending Site excavation and subsequent disposal. Investigation derived waste (i.e. paper towels, etc.) will be placed in trash bags, and disposed according to state and local regulations. Additionally, visqueen or plastic sheeting will be laid down in the work area and under the steam cleaner to help prevent cross decontamination and keep the work area clean.

Decontamination of equipment contaminated by PCBs, tools, and sampling equipment will be completed using the double wash/rinse method specified in 40 CFR 761.372. The first wash will cover the entire surface of the equipment with organic solvent in which PCBs are soluble to at least 5 percent by weight (such as isopropyl alcohol). Any runoff solvent will be contained and collected for disposal. Scrub rough surfaces with a scrub brush or disposable scrubbing pad and solvent such that the surface is always very wet for 1 minute. Wipe smooth surfaces with a solvent-soaked, disposable absorbent pad such that each surface is wiped for 1 minute. Wipe, mop, and/or sorb the solvent onto absorbent material until no visible traces of the solvent remain. The first rinse will wet the surface with clean rinse solvent such that the entire surface is very wet for 1 minute. The solvent is then drained from the surface and contained. The residual solvent is then drained of the surface using a clean, disposable absorbent pad until no liquid is visible on the surface. This process is then repeated with a second wash and rinse. Dispose of all solvents, cleaners, and absorbent materials in accordance with § 761.79(g).

Specify procedures for response to non-emergency chemical release.

No chemicals will be used during this project.

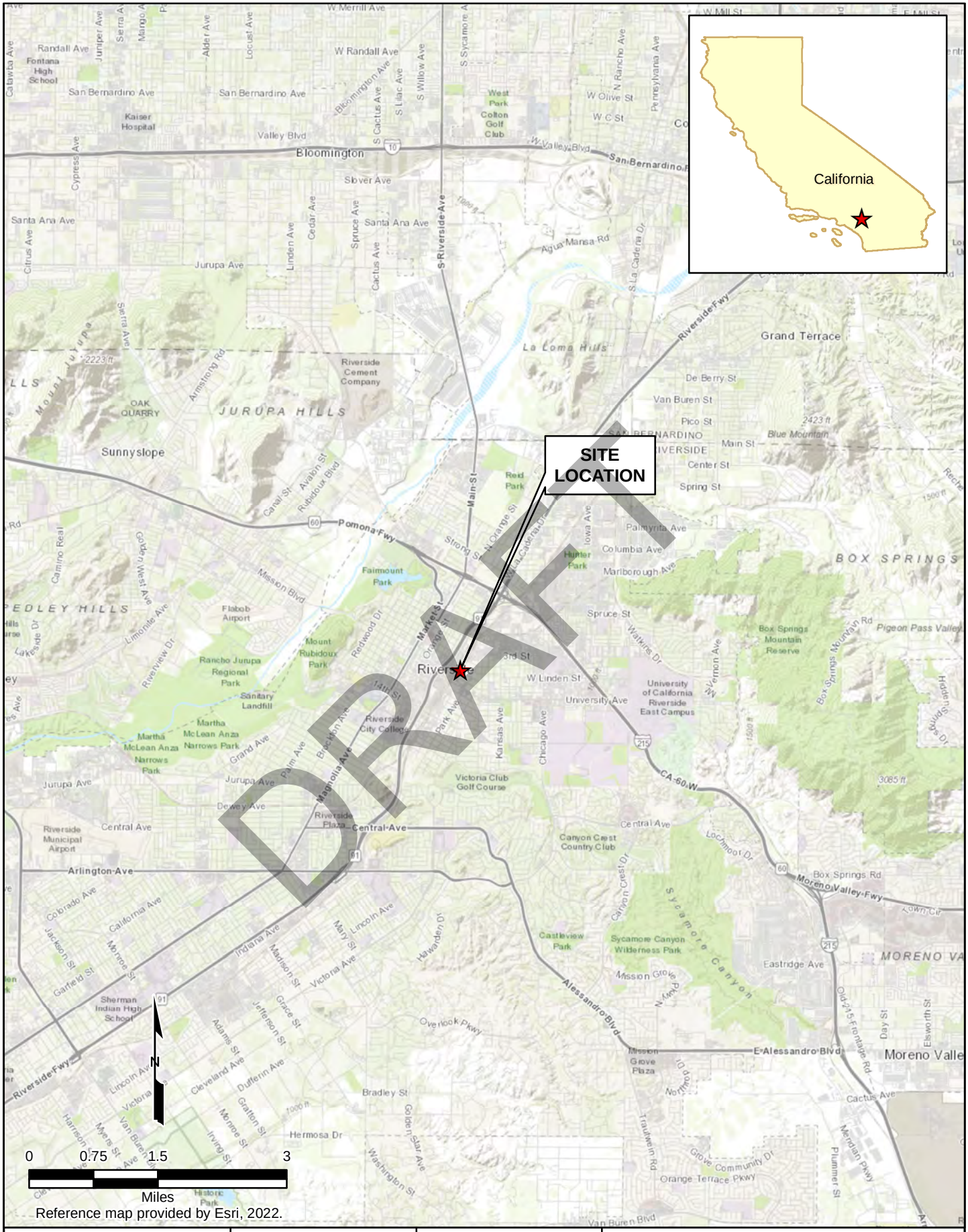
9.0 ADDITIONAL INFORMATION

Provide any additional information, procedures, or instructions as needed.

GSI will conduct a review of the site-specific Health and Safety Plan with subcontractors and other personnel on-site before the project is started. The SSO will record items discussed on the Daily Site Safety Record (Attachment 1). As a means of tracking attendance, all site personnel are expected to review and sign the HASP. The SSO will track onsite / offsite times on the Daily Site Safety Record. After lunch each day, GSI will hold a brief meeting to discuss any safety issues encountered during the morning hours that needs to be addressed in the afternoon, and to refresh all field personnel on the safety issues associated with the project tasks.

At the conclusion of each workday, the SSO will complete the Daily Site Safety Record form.

Figures



Reference map provided by Esri, 2022.

GSI ENVIRONMENTAL	GSI Job No. 6239	Drawn by: AV	**SITE LOCATION MAP**
	Issued: 2-Jun-2022	Chk'd by: SC	
	Revised:	Aprv'd by: TFW	Riverside Scrap Iron & Metal Riverside, California
	Map ID: RS6239_SLM	**FIGURE 1**	

LEGEND

- 8h — Site Area Designation (Geomatrix, 2005)
- Area Designation Border
- Site Boundary

Note

Basemap downloaded from Google Earth Pro dated October 2016.

SCALE (Feet)
0 70 140

Projected Coordinate System
Datum: NAD83
State Plane California Zone VI
Units: Feet

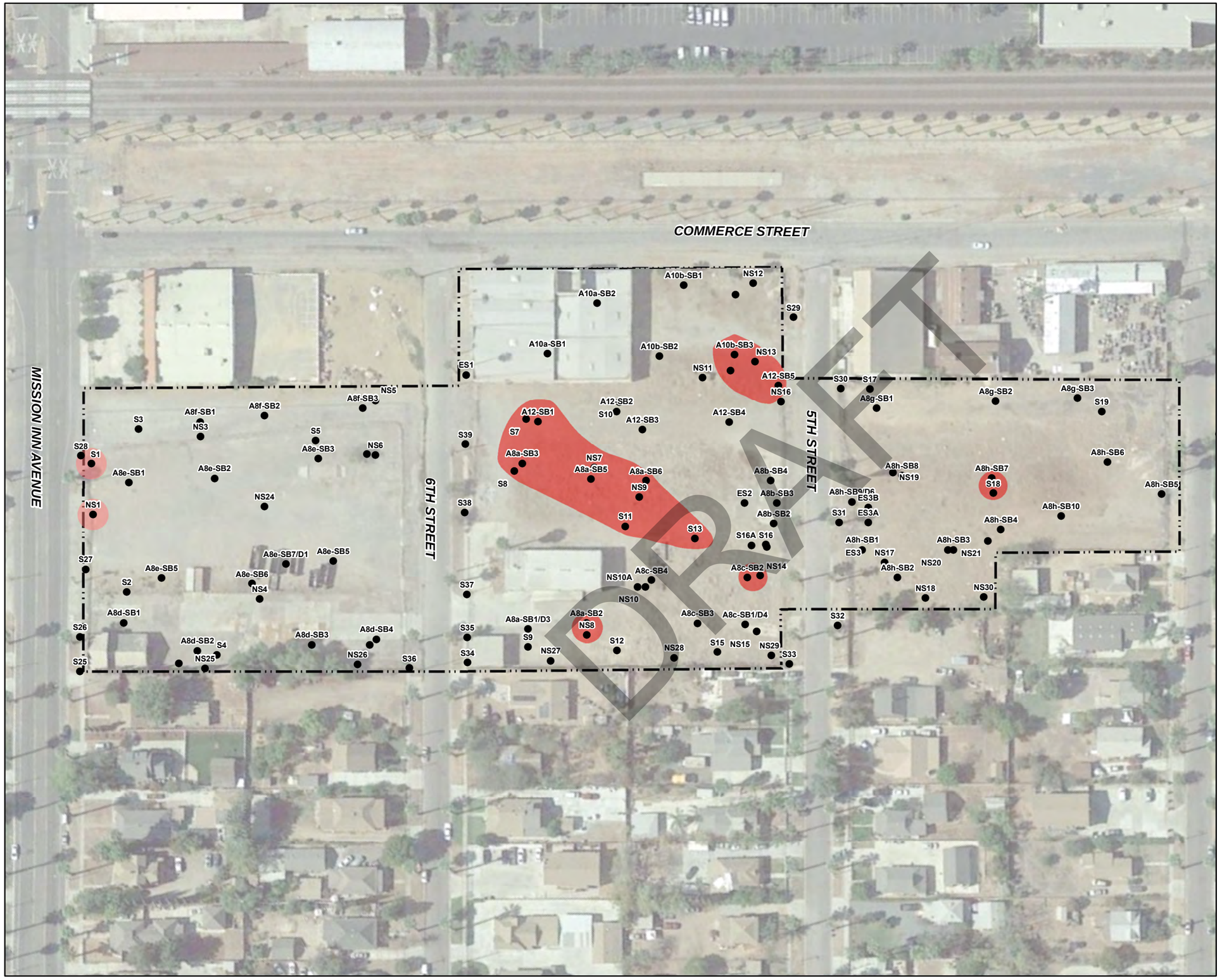
GSI ENVIRONMENTAL

SITE MAP

Former Riverside Scrap Iron & Metal Site
Riverside, California

GSI Job No. 6239	Drawn By: AV
Issued: 6-Feb-2023	Chk'd By: SC
Map ID: **RS6239_SiteMap**	Appv'd By: SC

FIGURE 2



LEGEND

- Previously Sample Location (AAA, 2011, AMEC, 2015, and Hillmann, 2017)

Targeted Excavation (Lead ≥1000 mg/kg or STLC ≥5mg/kg)

- 2.5 ft bgs
- 1.0 ft bgs
- 0.25 ft bgs
- Site Boundary

Notes

1) Basemap downloaded from Google Earth Pro dated October 2016.
2) ft bgs = feet below ground surface; mg/kg = milligrams per kilogram

SCALE (Feet)
0 50 100

Projected Coordinate System
Datum: NAD83
State Plane California Zone VI
Units: Feet

GSI ENVIRONMENTAL

PROPOSED TARGETED LEAD EXCAVATION AREAS ≥1000 mg/kg OR STLC ≥5 mg/kg

Former Riverside Scrap Iron & Metal Site
Riverside, California

GSI Job No. 6239	Drawn By: AV
Issued: 6-Feb-2023	Chk'd By: SC
Map ID: **RS6239_PbExcavation**	Appv'd By: SC

FIGURE 3A

LEGEND

- Previously Sampled Location (Ami Adini & Associates, 2011; AMEC, 2015) with Total PCB Arochlors Concentrations ≥50 mg/kg
- Excavation to 2.5 ft bgs
- PCBs Excavations ≥50 mg/kg
  Grid is 1.5 Meters x 1.5 Meters

Excavation (TPH)

- 5.0 ft bgs

Excavation (One or More PAHs ≥RSL or Background)

- 2.5 ft bgs
- 1.0 ft bgs

Targeted Excavation (Lead ≥1000 mg/kg or STLC ≥5mg/kg)

- 2.5 ft bgs
- 1.0 ft bgs

Excavation (PCBs ≥Residential RBSL)

- 2.5 ft bgs
- 1.0 ft bgs

Excavation (One or More Metals ≥RSL or Background)

- 2.5 ft bgs
- 1.0 ft bgs
- Site Boundary

Notes

1) Basemap downloaded from Google Earth Pro dated October 2016.
2) PAH = Polycyclic Aromatic Hydrocarbons; PCB = Polychloride Biphenyl; ft bgs = feet below ground surface; mg/kg = milligrams per kilogram; RSL = residential screening levels; RBSL = risk-based screening levels.

SCALE (Feet)
0 50 100

Projected Coordinate System
Datum: NAD83
State Plane California Zone VI
Units: Feet

GSI ENVIRONMENTAL

PROPOSED SITE EXCAVATION

Former Riverside Scrap Iron & Metal Site
Riverside, California

GSI Job No.	6239	Drawn By:	AV
Issued:	6-Feb-2023	Chk'd By:	SC
Map ID:	RS6239_PropExcavation	Appv'd By:	SC

FIGURE 3B

LEGEND

- Proposed Confirmation Sampling
- Prior Sampling Location (Hillman Consulting, February 2017)
- Off-site Excavation (One or More Metals ≥RSL or Background) at 1.0 ft bgs
- Site Boundary

Notes

1) Basemap provided by Esri ArcGIS Online, October 2017.
2) Excavation will not be conducted where ground surface is covered with asphaltic concrete.
3) The lateral extents of excavation boundaries will be defined either by existing locations with sampling results below remedial goals or confirmation.

SCALE (Feet)
0 15 30

Projected Coordinate System
Datum: NAD83
State Plane California Zone VI
Units: Feet

GSI ENVIRONMENTAL

PROPOSED OFF-SITE EXCAVATIONS - NORTH

Former Riverside Scrap Iron & Metal Site
Riverside, California

GSI Job No.	6239	Drawn By:	AV
Issued:	5-Apr-2023	Chk'd By:	SC
Map ID:	RS6239_PropOSExN	Appv'd By:	SC

FIGURE 3C

LEGEND

- Proposed Confirmation Sampling
- Prior Sampling Location (Hillman Consulting, 2017)
- On-Site PCB Excavation to 2.5 ft bgs
- Off-site Excavation (One or More Metals or PAH ≥RSL or Background) at1.0 ft bgs
- PCBs Excavations ≥50 mg/kg Grid is 1.5 Meters x 1.5 Meters
- Site Boundary

Notes

1) Basemap provided by Esri ArcGIS Online, October 2017.
2) Excavation will not be conducted where ground surface is covered with asphaltic concrete.
3) The lateral extents of excavation boundaries will be defined either by existing locations with sampling results below remedial goals or confirmation sampling.

SCALE (Feet)
0 15 30

Projected Coordinate System
Datum: NAD83
State Plane California Zone VI
Units: Feet

GSI ENVIRONMENTAL

PROPOSED OFF-SITE EXCAVATIONS - SOUTH

Former Riverside Scrap Iron & Metal Site
Riverside, California

GSI Job No.	6239	Drawn By:	AV
Issued:	4-Apr-2023	Chk'd By:	SC
Map ID:	**RS6239_PropOSExS**	Appv'd By:	SC

FIGURE 3D

LEGEND

- Proposed Confirmation Sampling
- 60 Feet x 60 Feet Grid
- Excavation to 2.5 ft bgs
- PCBs Excavations ≥50 mg/kg
  Grid is 1.5 Meters x 1.5 Meters

Excavation (TPH)

- 5.0 ft bgs

Excavation (One or More PAHs ≥RSL or Background)

- 2.5 ft bgs
- 1.0 ft bgs
- 0.25 ft bgs

Targeted Excavation (Lead ≥1000 mg/kg or STLC ≥5mg/kg)

- 2.5 ft bgs
- 1.0 ft bgs

Excavation (PCBs ≥Residental RBSL)

- 2.5 ft bgs
- 1.0 ft bgs

Excavation (One or More Metals ≥RSL or Background)

- 2.5 ft bgs
- 1.0 ft bgs
- Site Boundary

Notes

1) Basemap downloaded from Google Earth Pro dated October 2016.
2) PAH = Polycyclic Aromatic Hydrocarbons; PCB = Polychloride Biphenyl; ft bgs = feet below ground surface; mg/kg = milligrams per kilogram; RSL = residential screening levels; RBSL = risk-based screening levels; TPH = total petroleum hydrocarbons.

SCALE (Feet)
0 50 100

Projected Coordinate System
Datum: NAD83
State Plane California Zone VI
Units: Feet

GSI ENVIRONMENTAL

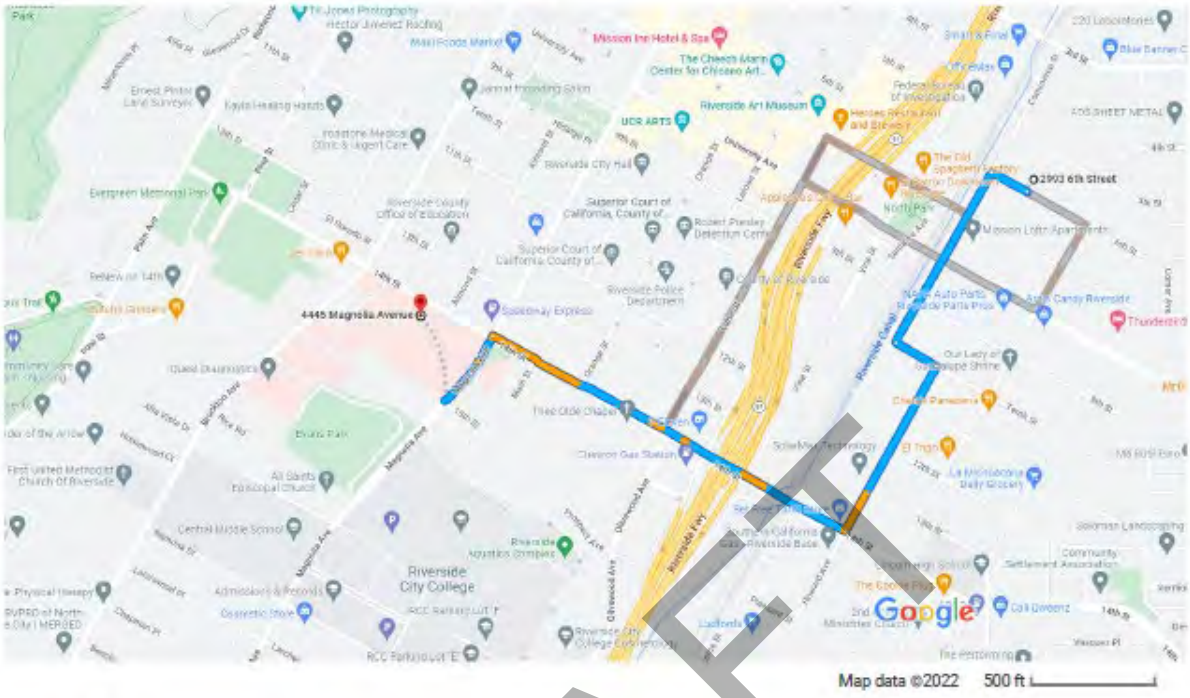
PROPOSED CONFIRMATION SAMPLES

Former Riverside Scrap Iron & Metal Site
Riverside, California

GSI Job No.	6239	Drawn By:	AV
Issued:	6-Feb-2023	Chk'd By:	SC
Map ID:	RS6239_PropConfirmSamp	Appv'd By:	SC

FIGURE 4

Google Maps 2993 6th St, Riverside, CA 92507 to 4445 Magnolia Ave, Riverside, CA 92501 Drive 1.5 miles, 6 min



2993 6th St
Riverside, CA 92507

1. Head northwest on 6th St toward Commerce St — 335 ft
2. Turn left onto Commerce St — 0.3 mi
3. Commerce St turns left and becomes Tenth St — 394 ft
4. Turn right onto Howard Ave — 0.3 mi
5. Turn right onto 14th St — 0.6 mi
6. Turn left onto Magnolia Ave — 0.1 mi

4445 Magnolia Ave
Riverside, CA 92501

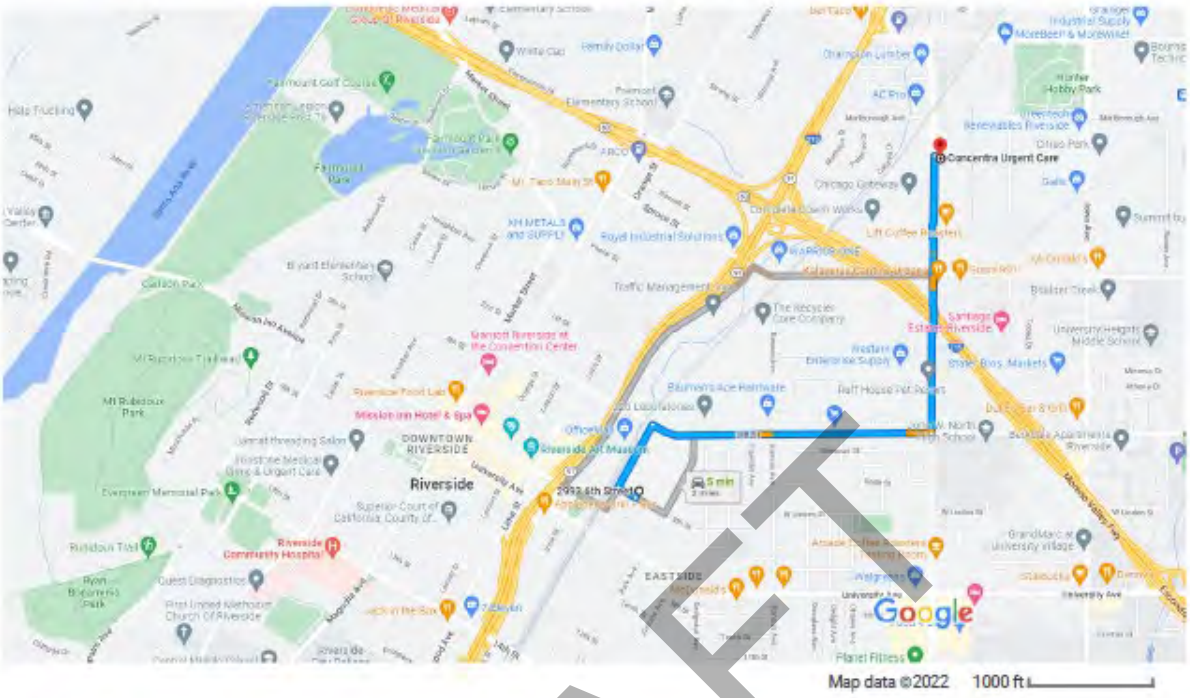
GSI ENVIRONMENTAL

FIGURE 5
NEAREST HOSPITAL

Riverside Community Hospital
4445 MagnoliaAvenue, Riverside, CA 92501

GSI Job No.: 6239
Issued: 8/15/2023
Prepared By: KKG
Approved By: XX

Google Maps 2993 6th St, Riverside, CA 92507 to Concentra Urgent Care, 1760 Chicago Ave # J3, Riverside, CA 92507 Drive 2.1 miles, 5 min



2993 6th St
Riverside, CA 92507

1. Head northwest on 6th St toward Commerce St — 335 ft
2. Turn right onto Commerce St — 0.2 mi
3. Turn right onto 3rd St — 0.9 mi
4. Turn left onto Chicago Ave — 0.9 mi
5. Turn right — 33 ft

Concentra Urgent Care
1760 Chicago Ave # J3, Riverside, CA 92507

GSI ENVIRONMENTAL

FIGURE 6
NEAREST URGENT CARE

Concentra Urgent Care
1760 Chicago Avenue, Suite J3, Riverside, CA 92507

GSI Job No.: 6239
Issued: 8/15/2023
Prepared By: KKG
Approved By: XX

Attachments

Attachment 1

Daily Site Safety Record

GSI Job No. _____
Date: _____
Page 1 of _____

GSI ENVIRONMENTAL

DAILY SITE SAFETY RECORD

Project/Location: _____

Site Safety Officer: _____

Meeting Conducted By: _____

Meeting Attended By:

	Name	Company	Time Onsite-Offsite	Time Onsite-Offsite
1				
2				
3				
4				
5				
6				
7				
8				

_____Additional Personnel (Attach additional sheets as needed).

Tasks To Be Performed	Personal Protective Equipment (PPE)

Attach additional sheets as needed

Safety Awareness Issues Discussed: _____

Air Quality Monitoring: Required:_____ or Not Required:_____

Note: if air quality monitoring is required, attach monitoring form and include monitoring equipment type, make and model.

ACCIDENTS/INJURIES/INCIDENTS

(Description of Incident, Actions Taken. Attach additional sheets as needed)

GSI ENVIRONMENTAL

DAILY SITE SAFETY RECORD

GSI Job No._____
Page 2 of _____
Date _____

Air Quality Monitoring:

_____Foxboro OVA 128 _____Other (Specify) _____
Calibration Check: 10 X Scale Reading (ppm)_____
(95 ppm Methane Gas) 100 X Scale Reading (ppm)_____

Time	Activity	Sample Point	Reading* (ppm)

* Reading above background, sustained for 1 minute period.

Action Level __ ppm Action Level Exceeded? _____

Action Taken_____

Remarks_____

GSI Job No. _____

Date: _____
Page _____ of _____

GSI ENVIRONMENTAL

DAILY SITE SAFETY RECORD

Attachment 2

Rule 1466

(Adopted July 7, 2017)(Amended December 1, 2017)

RULE 1466. CONTROL OF PARTICULATE EMISSIONS FROM SOILS WITH TOXIC AIR CONTAMINANTS

(a) Purpose

The purpose of this rule is to minimize the amount of off-site fugitive dust emissions containing toxic air contaminants by reducing particulate emissions in the ambient air as a result of earth-moving activities, including, excavating, grading, handling, treating, stockpiling, transferring, and removing soil that contains applicable toxic air contaminants from sites that meet the applicability requirements of subdivision (b).

(b) Applicability

(1) This rule shall apply to any owner or operator conducting earth-moving activities of soil with applicable toxic air contaminant(s) as defined in paragraph (c)(15) that have been identified as contaminant(s) of concern at a site that has been designated and notified by:

(A) The U.S. Environmental Protection Agency (U.S. EPA) as a Superfund National Priorities List site;

(B) The California Department of Toxic Substances Control (DTSC) as a Brownfield or Cleanup Program site;

(C) The State Water Resources Control Board (State Water Board) or Regional Water Quality Control Board (Regional Water Board) as a Site Cleanup Program site;

(D) A county, local, or state regulatory agency as a Hazardous Material Release site, as defined in California Health and Safety Code Section 25260, effective January 1, 2018; or

(E) The Executive Officer pursuant to subdivision (i).

(2) This rule shall not apply to:

(A) Earth-moving activities of soil with applicable toxic air contaminant(s) of less than 50 cubic yards; or

(B) Removal of soil for sampling purposes.

(c) Definitions

(1) ADEQUATELY WET is the condition of being sufficiently mixed or penetrated with water to prevent the release of particulates or visible emissions. The process

by which an adequately wet condition is achieved is by using a dispenser or water hose with a nozzle that permits the use of a fine, low-pressure spray or mist.

(2) ADJACENT ATHLETIC AREA is any outdoor athletic field or park where youth organized sports occur that is in physical contact or separated solely by a public roadway or other public right-of-way to a school or early education center.

(3) CHEMICAL STABILIZERS are any non-toxic chemical dust suppressant. The chemical stabilizers shall meet any specifications, criteria, or tests required by any federal, state, or local agency or any applicable law, rule, or regulation. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface and no less than what is specified by the manufacturer.

(4) DISTURBED SURFACE AREA is a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for fugitive dust. This definition excludes those areas which have:

(A) Been restored to a natural state, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby natural conditions;

(B) Been paved or otherwise covered by a permanent structure; or

(C) Sustained a vegetative ground cover of at least 70 percent of the native cover for a particular area for at least 30 days.

(5) DUST SUPPRESSANTS are water, hygroscopic materials, or chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(6) EARLY EDUCATION CENTER is any public or private property, used for purposes of education as defined as an Early Learning and Developmental Program by the U.S. Department of Education, but does not include any property in which education is primarily conducted in private homes. Early education center includes any building or structure, playground, athletic field, or other areas of early education center property.

(7) EARTH-MOVING ACTIVITIES are, for the purpose of this rule, any activity on a site that meets the applicability requirements of subdivision (b) where soil with applicable toxic air contaminant(s) are being moved or uncovered, and shall include, but not be limited to the following: excavating, grading, earth cutting and filling operations, loading or unloading, and adding to or removing from stockpiles.

(8) FUGITIVE DUST is, for the purpose of this rule, any solid particulate matter that is in contact with ambient air and has the potential to become airborne, other than solid particulate matter that is emitted from an exhaust stack.

(9) JOINT USE AGREEMENT PROPERTY is a shared public facility in which a formal agreement exists between a school or early education center and another government entity setting forth the terms and conditions for shared use.

(10) OWNER OR OPERATOR is any firm, business establishment, association, partnership, corporation or individual, whether acting as principal, agent, employee, contractor, or other capacity.

(11) PAVED ROAD is a public or private improved street, highway, alley, public way, or easement that is covered by typical roadway materials, but excluding access roadways that connect a facility with a public paved roadway and are not open to through traffic. Public paved roads are those open to public access and that are owned by any federal, state, county, municipal, or any other governmental or quasi-governmental agencies. Private paved roads are any paved roads not defined as public.

(12) PROPERTY LINE is the boundary of an area where a person has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.

(13) SCHOOL is any public or private education center, including juvenile detention facilities and education centers serving as the students' place of residence (e.g., boarding schools), used for purposes of the education of more than 12 children in kindergarten or any grades 1 to 12, inclusive, but does not include any school in which education is primarily conducted in private homes. School includes any building or structure, playground, athletic field, or other areas of school property.

(14) SOIL is dirt, sand, gravel, clay, and aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter.

(15) SOIL WITH APPLICABLE TOXIC AIR CONTAMINANT(S) means, for the purpose of this rule, soil that has been identified by the U.S. EPA, the DTSC, the State Water Board, the Regional Water Board, or a county, local, or state regulatory agency to contain one or more of the applicable toxic air contaminants as listed in Table I that exceed action levels as specified by the designating agency or, effective January 1, 2018, soil that has been identified by the Executive Officer to contain one or more of the toxic air contaminants listed in Rule 1401 – New Source Review of Toxic Air Contaminants Table I or Hazardous Air Pollutants Identified as Toxic Air Contaminants as listed in California Code of Regulations Section 93001, excluding volatile organic compounds regulated under Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil.

(16) STABILIZED SURFACE is any previously disturbed surface area or stockpile, which through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind driven fugitive dust, and is demonstrated to be stabilized. Stabilization can be demonstrated by one or more of the applicable test methods contained in the SCAQMD *Rule 403 Fugitive Dust Implementation Handbook* or in Volumes I and II of SCAQMD's *Dust Control in the Coachella Valley*.

(17) STOCKPILE is any accumulation of soil, which is not fully enclosed, covered, or chemically stabilized, and which attains a height of three feet or more and a total surface area of 150 square feet or more.

(18) TRACK-OUT is any soil that adheres to and agglomerates on the exterior surface of motor vehicles, haul trucks, and equipment (including tires) that has been released onto a paved road.

(19) WIND-DRIVEN FUGITIVE DUST is visible emissions from any disturbed surface area, which is generated by wind action alone.

(20) WIND GUST is the maximum instantaneous wind speed as measured by an anemometer.

(d) Monitoring Requirements

(1) When earth-moving activities or vehicular movement occurs, the owner or operator shall conduct continuous direct-reading near real-time ambient monitoring of PM_{10} concentrations pursuant to paragraph (d)(3).

(2) If the PM_{10} concentration averaged over two hours exceeds 25 micrograms per cubic meter, as measured pursuant to paragraph (d)(3) and as determined pursuant to paragraph (d)(4), the owner or operator shall cease earth-moving activities, apply dust suppressant to fugitive dust sources, or implement other dust control measures as necessary until the PM_{10} concentration is equal to or less than 25 micrograms per cubic meter averaged over 30 minutes.

(A) The owner or operator or designating agency may request an alternative PM_{10} limit from the Executive Officer provided the exposure to toxic air contaminants from fugitive dust from earth-moving activities at the proposed PM_{10} concentration level is health protective to the public. The owner or operator or designating agency shall provide the Executive Officer the information specified in subparagraphs (i)(1)(A) through (H) and substantiate its position that an alternative PM_{10} limit is health protective.

Use of an alternative PM_{10} limit must be submitted and approved by the Executive Officer as specified in subdivision (j).

(3) The owner or operator conducting earth-moving activities shall install and conduct ambient PM_{10} monitoring as follows:

(A) In accordance with a U.S. EPA-approved equivalent method for PM_{10} monitoring or an alternative method approved by the Executive Officer. The owner or operator or designating agency shall select an alternative PM_{10} method as specified in Appendix 1. Use of an alternative PM_{10} method must be submitted and approved by the Executive Officer as specified in subdivision (j);

(B) Using a minimum of one upwind monitor where the location of the upwind monitor(s) are indicative of background PM_{10} levels and not generally influenced by fugitive dust sources from the site;

(C) Using a minimum of one downwind monitor placed in the seasonal prevailing wind direction downwind of each area of earth-moving activity and as close to the property line as feasible;

(D) Using PM_{10} monitors that are identical in make and model; settings; calibration; configuration; and calibration, correction, and correlation factors.

(E) Operate, maintain, and calibrate ambient PM_{10} monitors in accordance with appropriate U.S. EPA-published documents for U.S. EPA-approved equivalent method(s) for PM_{10} or the alternative method approved by the Executive Officer, and manufacturer's instructions; and

(F) Collect ambient PM_{10} data with a data acquisition system that is capable of logging direct-reading near real-time data providing the date, time, and PM_{10} concentration in micrograms per cubic meter every 10 minutes or less.

(4) The owner or operator shall calculate the PM_{10} concentration based on the PM_{10} concentration averaged over two hours, starting at the top of each hour, where:

(A) The PM_{10} concentration is the absolute difference between the upwind and downwind monitors;

(B) If there is more than one upwind monitor, the upwind result is the two hour average of all upwind monitors;

(C) If there is more than one downwind monitor, the downwind average is the maximum two hour average concentration of any of the downwind monitors; and

(D) The owner or operator or designating agency may use an alternative calculation methodology if the owner or operator or designating agency provides information to substantiate that all or some the PM_{10} concentration is the result of another source and not attributed to the earth-moving activities of the site. Use of an alternative calculation methodology must be submitted and approved by the Executive Officer as specified in subdivision (j).

(5) When earth-moving activities occur, the owner or operator shall monitor wind direction and speed as specified in U.S. EPA *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements*.

(e) Requirements to Minimize Fugitive Dust Emissions

(1) An owner or operator shall not conduct earth-moving activities unless the area is surrounded with fencing that is a minimum of 6 feet tall and at least as tall as the height of the tallest stockpile, with a windscreen with a porosity of 50 ± 5%.

(2) An owner or operator conducting earth-moving activities shall:

(A) Adequately wet to the depth of earth-moving activity and allow time for penetration; and

(B) Adequately wet at frequencies to prevent the generation of visible dust plumes.

(3) An owner or operator that is moving vehicles on, within, or off a site where earth-moving activities are occurring shall:

(A) Post signs at all entrances of the site to designate the speed limit as 15 miles per hour;

(B) Stabilize the surface of all vehicular traffic and parking areas by applying gravel, paving, or dust suppressant;

(C) Not allow track-out to extend beyond 25 feet of the property line. Remove any track-out each day using a vacuum equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles;

(D) Clean the soil from the exterior of trucks, trailers, and tires prior to the truck leaving the site; and

(E) The owner or operator shall utilize at least one of the measures listed in clause (e)(3)(E)(i) through (e)(3)(E)(iv) at each vehicle egress from the site to a paved public road:

(i) Install a pad consisting of washed gravel (minimum-size: one inch), maintained in a clean condition, to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long;

(ii) Pave the surface extending at least 100 feet from the property line and at least 20 feet wide;

(iii) Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipes, or grates) at least 24 feet long and 10 feet wide; or

(iv) Install and utilize a wheel washing system to remove soil from tires and vehicle undercarriages.

(4) An owner or operator conducting earth-moving activities that result in the development of stockpiles of any soil with applicable toxic air contaminant(s) shall:

(A) Segregate non-contaminated stockpiles from stockpiles with applicable toxic air contaminant(s) and label with "SCAQMD Rule 1466 – Control of Particulate Emissions from Soils with Toxic Air Contaminant(s) Applicable Soil";

(B) Maintain stockpiles to avoid steep sides or faces that exceed the angle of repose;

(C) Not create a stockpile that is more than 400 cubic yards of soil and greater in height than the perimeter fencing and windscreen;

(D) Apply dust suppressant to stockpiles;

(E) At the end of each working day, either chemically stabilize and/or completely cover with 10 millimeter thick plastic sheeting that overlaps a minimum of 24 inches. The plastic sheeting shall be anchored and secured so that no portion of the soil is exposed to the atmosphere; and

(F) Daily, inspect stabilized or covered stockpiles. For a stabilized stockpile, such inspections shall include a demonstration of stabilization by one or more of the applicable test methods contained in SCAQMD *Rule 403 Fugitive Dust Implementation Handbook* or Volumes I and II of SCAQMD's *Dust Control in the Coachella Valley*. For a covered stockpile, such inspections shall include a visual inspection of all seams and plastic cover surfaces. Immediately re-stabilize or repair any holes, tears, or any other potential sources of fugitive toxic air contaminant emissions.

(5) An owner or operator conducting truck loading activities of soil containing applicable toxic air contaminant(s) shall:

(A) Apply dust suppressant to material prior to loading;

(B) Empty the loader bucket slowly so that no dust plumes are generated;

(C) Minimize the drop height from the loader bucket;

(D) Maintain at least six inches of space between the soil and the top of the truck bed while transporting within a site; and

(E) Completely tarp the truck and trailer prior to leaving the site.

(6) An owner or operator conducting truck unloading activities of soil containing applicable toxic air contaminant(s) shall:

(A) Apply dust suppressant to material prior to unloading; and

(B) Empty the trailer slowly so that no dust plumes are generated.

(7) The owner or operator shall immediately remove any spilled soil containing applicable toxic air contaminant(s).

(8) The owner or operator shall cease earth-moving activities if the wind speed is greater than 15 miles per hour (mph) averaged over a 15-minute period or instantaneous wind speeds exceed 25 mph.

(9) During earth-moving activities, the owner or operator shall have an on-site dust control supervisor that:

(A) Is employed by or contracted with the owner or operator;

(B) Is located on the site during working hours;

(C) Is in a position to expeditiously employ sufficient dust control measures to ensure compliance with all rule requirements;

(D) Has completed the SCAQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and

(E) Has the following credentials, if asbestos is an applicable toxic air contaminant:

(i) Successfully completed the Asbestos Abatement Contractor/Supervisor course pursuant to the Asbestos Hazard Emergency Response Act (AHERA), and obtained and maintained accreditation as an AHERA Asbestos Abatement Contractor/Supervisor; and

(ii) Trained on the provisions of 40 CFR Part 61.145, 61.146, 61.147 and 61.152 (Asbestos NESHAP provisions) and Part 763, and have the means by which to comply with these provisions.

(10) If earth-moving activities will not occur for three (3) or more consecutive days, apply a chemical stabilizer to potential sources of fugitive dust diluted to the concentration required to maintain a stabilized surface for the period of inactivity; re-stabilize as necessary.

(11) An owner or operator that is conducting earth-moving activities of soil with applicable toxic air contaminant(s) at a school, early education center, joint use agreement property, or adjacent athletic area shall:

(A) Only conduct earth-moving activities at a school or early education center outside of the hours between 7:30 a.m. and 4:30 p.m. on days when the school or early education center is in session;

(B) Not conduct earth-moving activities at a school, early education center, joint use agreement property, or adjacent athletic area if there is a school or early education center sponsored activity or youth organized sports at that site;

(C) Handle excavated soils with applicable toxic air contaminant(s) by:

(i) Immediately placing soil in a leak-tight container whereby any contained solids or liquids are prevented from escaping or spilling out;

(ii) Directly loading soil in trucks, applying dust suppressant, and covering prior to transporting; or

(iii) Stockpiling pursuant to paragraph (e)(4), in a fenced area that is not accessible to the general public, and locked when not in use; and

(D) Within five (5) days of its excavation, remove all soil with applicable toxic air contaminant(s) from the site.

(12) With the exception of paragraphs (e)(7) and (e)(11), the owner or operator or designating agency may use alternative dust control measures that meet the objective and effectiveness of the dust control measure it is replacing, where the objective and effectiveness of each category of dust control measures is stated in Appendix 2. Use of alternative dust control measures must be submitted and approved by the Executive Officer as specified under subdivision (j).

(f) Notification Requirements

(1) At least 72 hours and no more than 30 days prior to conducting any earth-moving activities on any site meeting the applicability requirements of subdivision (b), the owner or operator shall electronically notify the Executive Officer, using a format approved by the Executive Officer, of the intent to conduct any earth-moving activities. Notifications shall include the following requirements:

(A) Name, address, telephone number, and e-mail address of the owner or operator;

(B) Name, telephone number, and e-mail address of the on-site dust control supervisor;

(C) Project name and, if applicable, the project identification number from the designating agency;

(D) Project location (address and/or coordinates);

(E) Identify whether the site is a school, early education center, joint use agreement property, or adjacent athletic area;

(F) A map indicating the specific location(s) of each earth-moving activity and the concentrations of the applicable toxic air contaminant(s) and location of PM_{10} monitors;

(G) A description of the earth-moving activities, estimated volume of soil with applicable toxic air contaminant(s), and a schedule that includes the anticipated start and completion dates of earth-moving activities;

(H) Current and/or previous type of operation(s) and use(s) at the site;

(I) Applicable exemption(s); and

(J) Whether the notice is a revised notification.

(2) Notification Updates

Notifications pursuant to paragraph (f)(1) shall be updated when any of the following conditions arise:

(A) Earlier Start Date

A change in the start date of any earth-moving activity to an earlier date shall be reported to the SCAQMD no later than 72 hours before any earth-moving activities begin.

(B) Later Start Date

A delay in the start date of any earth-moving activity shall be reported to the SCAQMD as soon as the information becomes available, but no later than the original start date.

(C) Change in Exemption Status

Any change(s) in exemption status pursuant to subdivision (k) shall be reported to the SCAQMD as soon as the information becomes available, but no later than 48 hours after the information becomes available.

(3) Within 72 hours of an exceedance of the PM_{10} emission limit specified in subdivision (d), the owner or operator of a site meeting the applicability requirements of subdivision (b) shall electronically notify the Executive Officer, using a format approved by the Executive Officer, of the exceedance and shall include the following information:

(A) Name, address, telephone number, and e-mail address of the owner or operator;

(B) Name, telephone number, and e-mail address of the on-site dust control supervisor;

(C) Project name and, if applicable, the project identification number from the designating agency;

(D) Project location (address and/or coordinates);

(E) PM_{10} monitoring results, including result, date and time of exceedance(s), 12 hours before first exceedance, and 12 hours after last exceedance;

(F) Earth-moving activities occurring at the date and time of exceedance(s); and

(G) Dust control measure(s) taken to mitigate fugitive dust.

(g) Signage Requirements

When conducting earth-moving activities, the owner or operator shall install and maintain project signage.

(1) Unless otherwise approved in writing by the Executive Officer, signage shall:

(A) Be installed at all entrances and at intervals of 1,000 feet or less along the property line or perimeter of the site, with a minimum of one along each side;

(B) Be located between 6 and 8 feet above grade from the bottom of the sign;

(C) Display lettering at least four inches tall with text contrasting with the sign background; and

(D) Display the following information:

(i) Local or toll-free phone number for the site contact or pre-recorded notification center that is accessible 24 hours a day; and

(ii) Warning statement:

"THIS SITE CONTAINS SOILS THAT CONTAIN THE FOLLOWING CHEMICALS: [LIST APPLICABLE TOXIC AIR CONTAMINANT(S)]
TO REPORT ANY DUST LEAVING THE SITE PLEASE CALL [FACILITY CONTACT] OR THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AT 1-800-CUT-SMOG"

(E) If signage pursuant to paragraph (g)(1) exceeds 48 inches by 96 inches, the owner or operator or designating agency must still include the warning statement referenced in (g)(1)(D)(ii), displaying lettering at least four inches tall with text contrasting with the sign background, but may use 2.5 inch tall lettering to list applicable toxic air contaminants. All other signage requirements set forth in paragraph (g)(1) shall remain the same. If signage

continues to exceed 48 inches by 96 inches with these parameters, the owner or operator or designating agency may use alternative signage as set forth in paragraph (g)(2).

(2) The owner or operator or designating agency may use alternative signage approved by the Executive Officer pursuant to subdivision (j). Notwithstanding subdivision (j), the request shall include a visual representation of the alternative sign, including proposed lettering height, and locations and, at a minimum, the alternative signage shall:

(A) Display text contrasting with the sign background; and

(B) Display the following warning statement:

"THIS SITE CONTAINS SOILS THAT CONTAIN THE FOLLOWING CHEMICALS: [LIST APPLICABLE TOXIC AIR CONTAMINANT(S)] TO REPORT ANY DUST LEAVING THE SITE PLEASE CALL THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AT 1-800-CUT-SMOG"

(h) Recordkeeping Requirements

The owner or operator shall maintain records for a period of not less than three years and shall make such records available to the Executive Officer upon request. At a minimum, records shall be maintained daily and shall include:

(1) Inspection of all covered stockpiles containing soils with applicable toxic air contaminant(s);

(2) Results of wind and PM_{10} monitoring, including: instrument make and model; settings; calibration; configuration; calibration, correction, and correlation factors; maintenance; operator training; and daily instrument performance check records for all monitoring instruments;

(3) Earth-moving activities conducted and the corresponding volume of soil with applicable toxic air contaminant;

(4) Names and business addresses of the transporting and receiving facilities, and a copy of the shipping manifest; and

(5) Complaints called in, including the name of complainant and contact information, date and time, earth-moving activities occurring at the date and time, complaint, and action taken to mitigate the source of the complaint.

(i) Executive Officer Designated Sites

(1) The Executive Officer may designate a site if the Executive Officer has evidence that the site contains soil with applicable toxic air contaminant(s) as defined in paragraph (c)(15), after consultation with U.S. EPA, DTSC, the State or Regional Water Boards, and/or local, county, or state health and regulatory agencies, and consideration of the following:

(A) Site history, including current and/or previous type(s) of operation(s) and use(s) at the site and regulatory history;

(B) Concentration(s) of applicable toxic air contaminant(s) in the soil;

(C) Background concentration(s) of applicable toxic air contaminant(s);

(D) Volume of soil with applicable toxic air contaminant(s);

(E) Distance to a residence, park, or school;

(F) Meteorological data;

(G) Health risk information or other data provided by the owner or operator, if available; and

(H) Ambient monitoring data and other applicable data, if available.

(2) Prior to making a determination, the Executive Officer will notify the owner or operator in writing that the site may be subject to this rule.

(A) In the event the owner or operator exercises this opportunity to demonstrate that this rule does not apply, the owner or operator shall submit information to the Executive Officer within 14 days of the notification substantiating why the site should be excluded from this rule.

(B) Upon final determination, the Executive Officer will notify the owner or operator in writing if the site is subject to this rule.

(3) During the determination period, the owner or operator shall comply with the provisions of this rule or cease all earth-moving activities until a determination is made.

(j) Alternative Provisions

(1) If requesting an alternative provision pursuant to subparagraphs (d)(2)(A), (d)(3)(A), or (d)(4)(D) or paragraphs (e)(12), (g)(2), (k)(3), or (k)(4) the owner or operator or designating agency shall submit all information to the Executive Officer to substantiate its positon.

(A) The owner or operator or designating agency that elects to request alternative provisions for the PM_{10} limit, PM_{10} monitoring method, signage,

or direct loading exemption shall submit the request in writing at least 30 days prior to conducting any earth-moving activities.

(B) The owner or operator or designating agency that elects to request alternative provisions for the PM_{10} calculation or dust control measures shall submit the request, in writing, prior to an exceedance of the PM_{10} concentration requirements set forth in paragraph (d)(2).

(2) The Executive Officer may request additional information from the owner or operator or designating agency.

(3) The owner or operator or designating agency shall submit all requested information within 14 days of the request for additional information.

(4) The Executive Officer will review the request for an alternative provision and will approve or reject the data and notify the owner or operator or designating agency in writing. Approved alternative provisions may not be used retroactively.

(k) Exemptions

(1) The owner or operator may be exempt from one or more provisions of this rule provided there is written confirmation that the designating agency under subparagraphs (b)(1)(A) through (D) has consulted with the Executive Officer and has determined that the provision(s) are not needed based on information specified in subparagraphs (i)(1)(A) through (H).

(2) Earth-moving activities performed within an enclosed system vented to SCAQMD permitted air pollution control equipment shall be exempt from all requirements except: subparagraphs (e)(3)(C) through (e)(3)(E), subparagraphs (e)(5)(D) and (e)(5)(E), and subdivisions (f), (g), and (h).

(3) Linear trenching for natural gas, power, sewer, and water projects on roadways with soil with applicable toxic air contaminant(s), directly loaded into a truck or bin for transport, shall be exempt from all requirements except: paragraphs (e)(2) through (e)(8), paragraph (e)(11), and subdivisions (f), (h), and (i). The owner or operator or designating agency may use an alternative to directly load into a truck or bin for transport that meets the objective and effectiveness of directly loading soil, where the objective and effectiveness is stated in Appendix 2. Use of an alternative measure must be submitted and approved by the Executive Officer as specified under subdivision (j).

(4) Earth-moving activities consisting only of excavation activities of soil with applicable toxic air contaminant(s) of less than 500 cubic yards, directly loaded into a truck or bin for transport, shall be exempt from all requirements except:

paragraphs (e)(2) through (e)(8), paragraph (e)(11), and subdivisions (f), (h), and (i). The owner or operator or designating agency may use an alternative to directly load into a truck or bin for transport that meets the objective and effectiveness of directly loading soil, where the objective and effectiveness is stated in Appendix 2. Use of alternative measure must be submitted and approved by the Executive Officer as specified under subdivision (j).

(5) Active operations conducted during emergency life-threatening situations, or in conjunction with any officially declared disaster or state of emergency as declared by an authorized health officer, agricultural commissioner, fire protection officer, or other authorized agency officer shall be exempt from all requirements. The Executive Officer shall be notified electronically no later than 48 hours following such earth-moving activities. Written notification shall include written emergency declaration from the authorized officer.

(6) Active operations conducted by essential service utilities to provide electricity, natural gas, telephone, water, or sewer during periods of service outages and emergency disruptions shall be exempt from all requirements. The Executive Officer shall be notified electronically no later than 48 hours following such earth-moving activities.

Table I – Applicable Toxic Air Contaminants

CAS Number	Substance
7440-38-2 7784-42-1	**arsenic and arsenic compounds (inorganic)** including, but not limited to: arsenic compounds (inorganic) arsine
1332-21-4	asbestos
7440-43-9	cadmium and cadmium compounds
57-74-9	chlordane*

CAS Number	Substance
	dibenzo-p-dioxins (chlorinated)*
1746-01-6	tetrachlorodibenzo-p-dioxin, 2,3,7,8-
40321-76-4	pentachlorodibenzo-p-dioxin, 1,2,3,7,8-
39227-28-6	hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-
57653-85-7	hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-
19408-74-3	hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-
35822-46-9	heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-
3268-87-9	octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9-
41903-57-5	total tetrachlorodibenzo-p-dioxin
36088-22-9	total pentachlorodibenzo-p-dioxin
34465-46-8	total hexachlorodibenzo-p-dioxin
37871-00-4	total heptachlorodibenzo-p-dioxin
72-54-8	dichlorodiphenyldichloroethane*
72-55-9	dichlorodiphenyldichloroethylene*
50-29-3	dichlorodiphenyltrichloroethane*
18540-29-9	**chromium (hexavalent) and chromium compounds**
	including, but not limited to:
10294-40-3	barium chromate
13765-19-0	calcium chromate
7758-97-6	lead chromate
10588-01-9	sodium dichromate
7789-06-2	strontium chromate
13530-65-9	zinc chromate
7439-92-1	**lead and lead compounds (inorganic, including elemental lead)**
	including, but not limited to:
	lead compounds (inorganic)
301-04-2	lead acetate
7758-97-6	lead chromate

CAS Number	Substance
7446-27-7	lead phosphate
1335-32-6	lead subacetate
7439-97-6	**mercury and mercury compounds (inorganic)**
	including, but not limited to:
7487-94-7	mercuric chloride
593-74-8	methyl mercury
7440-02-0	**nickel and nickel compounds**
	including, but not limited to:
373-02-4	nickel acetate
3333-67-3	nickel carbonate
13463-39-3	nickel carbonyl
12054-48-7	nickel hydroxide
1313-99-1	nickel oxide
12035-72-2	nickel subsulfide
1271-28-9	nickelocene
	refinery dust from the pyrometallurgical process
1336-36-3	**polychlorinated biphenyls (PCBs)**
32598-13-3	3,3’,4,4’-tetrachlorobiphenyl
70362-50-4	3,4,4’,5-tetrachlorobiphenyl
32598-14-4	2,3,3’,4,4’-pentachlorobiphenyl
74472-37-0	2,3,4,4’,5-pentachlorobiphenyl
31508-00-6	2,3’,4,4’,5-pentachlorobiphenyl
65510-44-3	2,3',4,4',5'-pentachlorobiphenyl
57465-28-8	3,3’,4,4’,5-pentachlorobiphenyl
38380-08-4	2,3,3’,4,4’,5-hexachlorobiphenyl
69782-90-7	2,3,3’,4,4’,5’-hexachlorobiphenyl
52663-72-6	2,3’,4,4’,5,5’-hexachlorobiphenyl
32774-16-6	3,3’,4,4’,5,5’-hexachlorobiphenyl
39635-31-9	2,3,3’4,4’,5,5’-heptachlorobiphenyl

CAS Number	Substance
	polycyclic aromatic hydrocarbons (PAHs)*
56-55-3	benzo[a]anthracene
50-32-8	benzo[a]pyrene
205-99-2	benzo[b]fluoranthene
207-08-9	benzo[k]fluoranthene
218-01-9	chrysene
53-70-3	dibenz[a,h]anthracene
193-39-5	indeno[1,2,3-c,d]pyrene

* Effective January 1, 2018

Appendix 1 – Executive Officer Approved PM_{10} Monitors

The Executive Officer may approve PM_{10} monitors that meeting the following requirements.

1. PM_{10} monitors must be continuous direct-reading near-real time monitors and shall monitor particulate matter less than 10 microns.
2. PM_{10} monitors must be equipped with:
   a. Omni-directional heated sampler inlet;
   b. Sample pump;
   c. Volumetric flow controller;
   d. Enclosure; and
   e. Data logger capable of logging each data point with average concentration, time/date, and data point number.
3. PM_{10} monitors must have the following minimum performance standards:
   a. Range: 0 - 10,000 $\mu g/m^3$
   b. Accuracy: ±5% of reading ± precision
   c. Resolution: 1.0 $\mu g/m^3$
   d. Measurement Cycle: User selectable (30 minute and 2 hour)
4. In order to ensure the validity of the PM_{10} measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the owner or operator to adequately supplement QA/QC Plans to include the following critical features: instrument calibration, instrument maintenance, operator training, and daily instrument performance (span) checks.

Appendix 2 – Objectives and Effectiveness of Dust Control Measures Set-Forth in Subdivision (e)

Dust Control Measure	Objective	Effectiveness
(e)(1) Fencing and Windscreen Requirement	To minimize off-site fugitive dust emissions containing toxic air contaminants, provide a wind break, act as containment, provide security, and limit access to unauthorized persons.	Any dust control measure that is equally or more effective in minimizing off-site fugitive dust emissions containing toxic air contaminants that may result in exposure to the general public and will limit public access to the site.
(e)(2) Water Application	To minimize fugitive dust emissions containing toxic air contaminants from earth-moving activities.	Any dust control measure that is equally or more effective at preventing the generation of visible dust plumes from earth-moving activities.
(e)(3) Vehicle Movement	To minimize fugitive dust emissions containing toxic air contaminants from on-site vehicles and as vehicles are moving off-site.	Any dust control measure that is equally or more effective at preventing the generation of dust plumes from on-site vehicle movement and any fugitive dust that can be tracked out of the site that can result in exposure to the general public.
(e)(4) Stockpiles	To minimize fugitive dust emissions containing toxic air contaminants from stockpiles.	Any dust control measure that is equally or more effective at minimizing fugitive dust emissions containing toxic air contaminants from stockpiles and that will prevent the generation of dust plumes from stockpiles that can result

Dust Control Measure	Objective	Effectiveness
		in exposure to the general public.
(e)(5) Truck Loading	To minimize fugitive dust emissions containing toxic air contaminants from truck loading and truck movement.	Any dust control measure that is equally or more effective at preventing a dust plume or fugitive dust occurring during the loading of soils containing toxic air contaminants into trailers and physical containment or other mechanisms to minimize fugitive dust from escaping the trailer during transport.
(e)(6) Truck Unloading	To minimize fugitive dust emissions containing toxic air contaminants from truck unloading and truck movement.	Any dust control measure that is equally or more effective at preventing a dust plume or fugitive dust occurring during the unloading of soils containing toxic air contaminants.
(e)(8) Earth-Moving Activities at Certain Wind Speeds	To minimize fugitive dust emissions containing toxic air contaminants from high wind events.	Any dust control measure that is equally or more effective at preventing a dust plume or fugitive dust occurring during high wind events.
(e)(9) On-site Dust Control Supervisor	To require the on-site presence of a person that has specific training to ensure compliance with all rule requirements.	Any measure that ensures the on-site presence of a person with training covering the same material as that covered by an SCAQMD Fugitive Dust Control Class and appropriate credentials to handle applicable toxic air contaminants and that can

Dust Control Measure	Objective	Effectiveness
		ensure compliance with all rule requirements.
(e)(10) Application of Chemical Stabilizer During Periods of Inactivity	To minimize a dust plume or fugitive dust emissions containing toxic air contaminants from occurring on-site during periods of inactivity.	Any dust control measure that is equally or more effective at preventing a dust plume or fugitive dust emissions containing toxic air contaminants from occurring on-site during periods of inactivity.
(k)(3)/(k)(4) Direct Load into a Truck or Bin for Transport	To minimize a dust plume or fugitive dust emissions containing toxic air contaminants from truck loading and unloading.	Any dust control measure that is equally or more effective at preventing a dust plume or fugitive dust emissions containing toxic air contaminants from truck loading and unloading.

Attachment 3

NIOSH Pocket Guide Printouts

Arsenic (inorganic compounds, as As)

Synonyms & Trade Names

Arsenia, Arsenic metal [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite and all inorganic compounds containing arsenic except ARSINE.]

CAS No.

7440-38-2 (metal)

RTECS No.

CG0525000 (metal)

DOT ID & Guide

1558 152(metal)
1562 152(dust)

Formula

As (metal)

Conversion

IDLH

Ca [5 mg/m^3 (as As)]
See: 7440382

Exposure Limits

NIOSH REL

Ca C 0.002 mg/m^3 [15-minute] See Appendix A (nengapdxa.html)

OSHA PEL

[1910.1018] TWA 0.010 mg/m^3

Measurement Methods

NIOSH 7300 , 7301 , 7303 , 7900 , 9102 ;
OSHA ID105
See: NMAM or OSHA Methods

Physical Description
Metal: Silver-gray or tin-white, brittle, odorless solid.

Molecular Weight
74.9

Boiling Point
Sublimes

Melting Point
1135°F (Sublimes)

Solubility
Insoluble

Vapor Pressure
0 mmHg (approx)

Ionization Potential
NA

Specific Gravity
5.73 (metal)

Flash Point
NA

Upper Exposive Limit
NA

Lower Explosive Limit
NA

Carbon black

Synonyms & Trade Names
Acetylene black, Channel black, Furnace black, Lamp black, Thermal black

CAS No.
1333-86-4

RTECS No.
FF5800000

DOT ID & Guide

Formula
C

Conversion

IDLH
1750 mg/m^3
See: 1333864

Exposure Limits
NIOSH REL
TWA 3.5 mg/m^3 Ca TWA 0.1 mg PAHs/m^3 [Carbon black in presence of polycyclic aromatic hydrocarbons (PAHs)] See Appendix A (nengapdxa.html) See Appendix C (nengapdxc.html)
OSHA PEL
TWA 3.5 mg/m^3

Measurement Methods
NIOSH 5000 ;
OSHA ID196
See: NMAM or OSHA Methods

Physical Description
Black, odorless solid.

Molecular Weight
12.0

Boiling Point
Sublimes

Melting Point
Sublimes

Solubility
Insoluble

Vapor Pressure
0 mmHg (approx)

Ionization Potential
NA

Specific Gravity
1.8-2.1

Flash Point
NA

Upper Exposive Limit
NA

Lower Explosive Limit
NA

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Providing National and World Leadership to Prevent Workplace Illnesses and Injuries NIOSH

Lead

Synonyms & Trade Names	CAS No.	RTECS No.	DOT ID & Guide	Formula	Conversion
Lead metal, Plumbum	7439-92-1	OF7525000		Pb	

IDLH
100 mg/m^3 (as Pb)
See: 7439921

Exposure Limits

NIOSH REL
TWA (8-hour) 0.050 mg/m^3 See Appendix C (nengapdxc.html) [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]

OSHA PEL
[1910.1025] TWA 0.050 mg/m^3 See Appendix C (nengapdxc.html) [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]

Measurement Methods

NIOSH 7082 , 7105 , 7300 , 7301 , 7303 , 7700 , 7701 , 7702 , 9100 , 9102 , 9105 ;
OSHA ID206 , ID121 , ID125G
See: NMAM or OSHA Methods

Physical Description

A heavy, ductile, soft, gray solid.

Molecular Weight	Boiling Point	Melting Point	Solubility	Vapor Pressure	Ionization Potential
207.2	3164°F	621°F	Insoluble	0 mmHg (approx)	NA

Specific Gravity	Flash Point	Upper Exposive Limit	Lower Explosive Limit
11.34	NA	NA	NA

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities
Strong oxidizers, hydrogen peroxide, acids

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

Symptoms
lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension

Target Organs
Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

Personal Protection/Sanitation
(See protection codes (protect.html))
Skin:Prevent skin contact
Eyes:Prevent eye contact
Wash skin:Daily
Remove:When wet or contaminated
Change:Daily

First Aid
(See procedures (firstaid.html))
Eye:Irrigate immediately
Skin:Soap flush promptly
Breathing:Respiratory support
Swallow:Medical attention immediately

Respirator Recommendations
(See Appendix E) (nengapdxe.html)
NIOSH/OSHA

Up to 0.5 mg/m^3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.

Up to 2.5 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Up to 100 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(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 with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also
INTRODUCTION ICSC CARD: 0052 MEDICAL TESTS: 0127

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Chlorodiphenyl (54% chlorine)

Synonyms & Trade Names

Aroclor® 1254, PCB [Chlorodiphenyl (54% chlorine)], Polychlorinated biphenyl [Chlorodiphenyl (54% chlorine)]

CAS No.	RTECS No.	DOT ID & Guide	Formula	Conversion
11097-69-1	TQ1360000	2315 171	$C_6H_3Cl_2C_6H_2Cl_3$ (approx)	

IDLH

Ca [5 mg/m^3]

See: IDLH INDEX

Exposure Limits

NIOSH REL

Ca TWA 0.001 mg/m^3 See Appendix A (nengapdxa.html) [*Note: The REL also applies to other PCBs.]

OSHA PEL

TWA 0.5 mg/m^3 [skin]

Measurement Methods

NIOSH 5503 ;

OSHA PV2088

See: NMAM or OSHA Methods

Molecular Weight	Boiling Point	Freezing Point	Solubility	Vapor Pressure	Ionization Potential
326 (approx)	689-734°F	50°F	Insoluble	0.00006 mmHg	?

Physical Description

Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.

Specific Gravity	Flash Point	Upper Exposive Limit	Lower Explosive Limit
(77°F): 1.38	NA	NA	NA

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities

Strong oxidizers

Exposure Routes

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

Symptoms

irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

Target Organs

Skin, eyes, liver, reproductive system

Cancer Site

[in animals: tumors of the pituitary gland & liver, leukemia]

Personal Protection/Sanitation

(See protection codes (protect.html))
Skin:Prevent skin contact
Eyes:Prevent eye contact
Wash skin:When contaminated
Remove:When wet or contaminated
Change:Daily
Provide:Eyewash, Quick drench

First Aid
(See procedures (firstaid.html))
Eye:Irrigate immediately
Skin:Soap wash immediately
Breathing:Respiratory support
Swallow:Medical attention immediately

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 having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also
INTRODUCTION ICSC CARD: 0939 MEDICAL TESTS: 0176

File Formats Help:

How do I view different file formats (PDF, DOC, PPT, MPEG) on this site? (//www.cdc.gov/Other/plugins/)

(//www.cdc.gov/Other/plugins/#pdf)

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Centers for Disease Control and Prevention
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SEARCH

Enter search terms separated by spaces.

Tetrachloroethylene

Synonyms & Trade Names Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene

CAS No. 127-18-4	**RTECS No.** KX3850000 (/niosh-rtecs/KX3ABF10.html)	**DOT ID & Guide** 1897 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx/guide160/) (http://www.cdc.gov/Other/disclaimer.html)
Formula $Cl_2C=CCl_2$	**Conversion** 1 ppm = 6.78 mg/m^3	**IDLH** Ca [150 ppm] See: 127184 (/niosh/idlh/127184.html)
Exposure Limits **NIOSH REL** : Ca Minimize workplace exposure concentrations. See Appendix A (nengapdxa.html) **OSHA PEL** † (nengapdxg.html) : TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm		**Measurement Methods** **NIOSH** 1003 (/niosh/docs/2003-154/pdfs/1003.pdf) ; **OSHA** 1001 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
165.8	250°F	-2°F	0.02%	14 mmHg	9.32 eV
Sp.Gr: 1.62	**Fl.P:** NA	**UEL:** NA	**LEL:** NA		

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

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

Symptoms irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

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

Cancer Site [in animals: liver tumors]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

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

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0076 (/niosh/ipcsneng/neng0076.html) See MEDICAL TESTS: 0179 (/niosh/docs/2005-110/nmed0179.html)

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Centers for Disease Control and Prevention 1600 Clifton Road Atlanta, GA 30329-4027, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Trichloroethylene

Synonyms & Trade Names Ethylene trichloride, TCE, Trichloroethene, Trilene

CAS No. 79-01-6	**RTECS No.** KX4550000 (/niosh-rtecs/KX456D70.html)	**DOT ID & Guide** 1710 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx/guide160/) (http://www.cdc.gov/Other/disclaimer.html)
Formula $ClCH{=}CCl_2$	**Conversion** 1 ppm = 5.37 mg/m^3	**IDLH** Ca [1000 ppm] See: 79016 (/niosh/idlh/79016.html)
Exposure Limits **NIOSH REL** : Ca See Appendix A (nengapdxa.html) See Appendix C (nengapdxc.html) **OSHA PEL** † (nengapdxg.html) : TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)		**Measurement Methods** **NIOSH** 1022 (/niosh/docs/2003-154/pdfs/1022.pdf) , 3800 (/niosh/docs/2003-154/pdfs/3800.pdf) ; **OSHA** 1001 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
131.4	189°F	-99°F	0.1%	58 mmHg	9.45 eV
Sp.Gr: 1.46	**Fl.P:** ?	UEL(77°F): 10.5%	LEL(77°F): 8%		

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

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

Symptoms irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

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

Cancer Site [in animals: liver & kidney cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

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

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0081 (/niosh/ipcsneng/neng0081.html) See MEDICAL TESTS: 0236 (/niosh/docs/2005-110/nmed0236.html)

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Attachment 4

Chemical Safety Data Sheets (SDS)

Isobutylene

Safety Data Sheet P-4614

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1979 Revision date: 10/17/2016 Supersedes: 02/27/2015

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Isobutylene
CAS No	:	115-11-7
Formula	:	C4H8 / CH2=C(CH3)2
Other means of identification	:	Isobutene, 2-methylpropene

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number	:	Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Gas 1 H220
Liquefied gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS02 GHS04

Signal word (GHS-US) : DANGER

Hazard statements (GHS-US) :
H220 - **EXTREMELY FLAMMABLE GAS**
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR
CGA-HG01 - MAY CAUSE FROSTBITE

Precautionary statements (GHS-US) :
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking
P271+P403 - Use and store only outdoors or in a well-ventilated place
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - Eliminate all ignition sources if safe to do so
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG12 - Do not open valve until connected to equipment prepared for use
CGA-PG06 - Close valve after each use and when empty
CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name	Product identifier	%
Isobutylene (Main constituent)	(CAS No) 115-11-7	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

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

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog.

5.2. Special hazards arising from the substance or mixture

Fire hazard : **EXTREMELY FLAMMABLE GAS**. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard : **EXTREMELY FLAMMABLE GAS**. Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions : **DANGER: FLAMMABLE LIQUID AND VAPOR.** Evacuate all personnel from danger area. Use self-contained breathing apparatus. Immediately cool surrounding containers with water spray from maximum distance, taking care not to extinguish flames. Avoid spreading burning liquid with water. Remove ignition sources if safe to do so. If flames are accidentally extinguished, explosive reignition may occur. Reduce vapors with water spray or fog. Stop flow of liquid if safe to do so, while continuing cooling water spray. Remove all containers from area of fire if safe to do so. Allow fire to burn out. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1919 Subpart L - Fire Protection.

Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Other information	:	Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER: Flammable, liquefied gas.** FORMS EXPLOSIVE MIXTURES WITH AIR. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if safe to do so. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking/No Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Isobutylene (115-11-7)		
ACGIH	ACGIH TLV-TWA (ppm)	250 ppm

8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): **Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.

Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Molecular mass : 56 g/mol

Color : Colorless.

Odor : Poor warning properties at low concentrations. Sweetish.

Odor threshold : Odor threshold is subjective and inadequate to warn for overexposure.

pH : Not applicable.

Relative evaporation rate (butyl acetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -140.3 °C

Freezing point : No data available

Boiling point	:	-6.9 °C
Flash point	:	-80 °C (closed cup)
Critical temperature	:	144.7 °C
Auto-ignition temperature	:	465 °C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	1.8 - 8.8 vol %
Vapor pressure	:	260 kPa
Critical pressure	:	4000 kPa
Relative vapor density at 20 °C	:	No data available
Relative density	:	0.63
Density	:	0.599 g/cm³ (at 20 °C)
Relative gas density	:	2
Solubility	:	Water: 388 mg/l
Log Pow	:	2.35
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	No data available

9.2. Other information

Gas group	:	Liquefied gas
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

High temperature. Catalyst.

10.5. Incompatible materials

Halogens. Oxidizing agents. Acids.

10.6. Hazardous decomposition products

Thermal decomposition may produce : Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Isobutylene (\f)115-11-7	
LC50 inhalation rat (mg/l)	620 mg/l/4h
LC50 inhalation rat (ppm)	541657 ppm/1h
ATE US (gases)	270828.500 ppmV/4h
ATE US (vapors)	620.000 mg/l/4h
ATE US (dust, mist)	620.000 mg/l/4h

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Isobutylene (115-11-7)	
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Isobutylene (115-11-7)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

Isobutylene (115-11-7)	
Log Pow	2.35
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Isobutylene (115-11-7)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1055 Isobutylene, 2.1

UN-No.(DOT) : UN1055

Proper Shipping Name (DOT) : Isobutylene

Class (DOT) : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115

Hazard labels (DOT) : 2.1 - Flammable gas

DOT Special Provisions (49 CFR 172.102) : 19 - For domestic transportation only, the identification number UN1075 may be used in place of the identification number specified in column (4) of the 172.101 table. The identification number used must be consistent on package markings, shipping papers and emergency response information
T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter

Additional information

Emergency Response Guide (ERG) Number : 115 (UN1055)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1055

Proper Shipping Name (IMDG) : ISOBUTYLENE

Class (IMDG) : 2 - Gases

MFAG-No : 115

Air transport

UN-No. (IATA) : 1055

Proper Shipping Name (IATA) : Isobutylene

Class (IATA) : 2

Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Isobutylene (115-11-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard Sudden release of pressure hazard Fire hazard

15.2. International regulations

CANADA

Isobutylene (115-11-7)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Isobutylene (115-11-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Isobutylene (115-11-7)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

Isobutylene(115-11-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

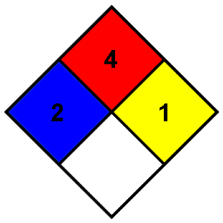
Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

Praxair SDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.com. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (Phone: 1-800-PRAXAIR/1-800-772-9247; Address: Praxair Call Center, Praxair, Inc, P.O. Box 44, Tonawanda, NY 14151-0044)

NFPA health hazard	: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
NFPA fire hazard	: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
NFPA reactivity	: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health	: 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability	: 4 Severe Hazard
Physical	: 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Methanol
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 07/03/2013 Revision date: 03/08/2019 Supersedes: 12/12/2017 Version: 1.3

SECTION 1: Identification

1.1. Identification

Product form : Substance
Substance name : Methanol
CAS-No. : 67-56-1
Product code : VT430
Formula : CH4O
Synonyms : acetone alcohol / alcohol C1 / alcohol, methyl / carbinol / colonial spirits / columbian spirits / green wood spirits / manhattan spirits / methyl alcohol / methyl hydrate / methyl hydroxide / methylen / methylol / monohydroxymethane / pyroligneous spirit / pyroxylic spirit / wood alcohol / wood naphtha

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Solvent
Recommended use : Laboratory chemicals
Restrictions on use : Not for food, drug or household use

1.3. Supplier

Val Tech Diagnostics, A Division of LabChem Inc
Jackson's Pointe Commerce Park Building 1000
1010 Jackson's Pointe Court
Zelienople, PA 16063
T 412-826-5230
F 724-473-0647

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 or +1-703-741-5970

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Flammable liquids Category 2	H225	Highly flammable liquid and vapour
Acute toxicity (oral) Category 3	H301	Toxic if swallowed
Acute toxicity (dermal) Category 3	H311	Toxic in contact with skin
Acute toxicity (inhalation) Category 3	H331	Toxic if inhaled
Specific target organ toxicity (single exposure) Category 1	H370	Causes damage to organs (liver, kidneys, central nervous system, optic nerve) (Dermal, oral)

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Danger

Hazard statements (GHS US) : H225 - Highly flammable liquid and vapour
H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled
H370 - Causes damage to organs (liver, kidneys, central nervous system, optic nerve) (Dermal, oral)

Precautionary statements (GHS US) : P210 - Keep away from heat, sparks, open flames, hot surfaces. - No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating, lighting equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P260 - Do not breathe mist, vapors, spray.

P264 - Wash exposed skin thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330 - If swallowed, rinse mouth
P361+P364 - Take off immediately all contaminated clothing and wash it before reuse.
P370+P378 - In case of fire: Use carbon dioxide (CO_2), powder, alcohol-resistant foam to extinguish
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container to comply with local, state and federal regulations.

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	GHS US classification
Methanol (Main constituent)	(CAS-No.) 67-56-1	100	Flam. Liq. 2, H225 Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Inhalation), H331 STOT SE 1, H370

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain.

First-aid measures after inhalation : Remove the victim into fresh air. Immediately consult a doctor/medical service.

First-aid measures after skin contact : Wash immediately with lots of water. Soap may be used. Do not apply (chemical) neutralizing agents. Remove clothing before washing. Consult a doctor/medical service.

First-aid measures after eye contact : Rinse with water. Remove contact lenses, if present and easy to do. Continue rinsing. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion : Rinse mouth with water. Immediately after ingestion, give alcohol to drink. Give nothing to drink. Do not induce vomiting. Immediately consult a doctor/medical service. Take the container/vomit to the doctor/hospital. Call Poison Information Centre (www.big.be/antigif.htm).

4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms : Toxic in contact with skin. Toxic if swallowed. Toxic if inhaled.

Symptoms/effects after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Coughing. Symptoms similar to those listed under ingestion.

Symptoms/effects after skin contact : Symptoms similar to those listed under ingestion.

Symptoms/effects after eye contact : Redness of the eye tissue. Lacrimation.

Symptoms/effects after ingestion : Nausea. Vomiting. AFTER ABSORPTION OF LARGE QUANTITIES: FOLLOWING SYMPTOMS MAY APPEAR LATER: Change in the blood composition. Headache. Feeling of weakness. Abdominal pain. Muscular pain. Central nervous system depression. Dizziness. Mental confusion. Drunkenness. Coordination disorders. Disturbed motor response. Disturbances of consciousness. Visual disturbances. Blindness. Respiratory difficulties. Cramps/uncontrolled muscular contractions.

Chronic symptoms : Red skin. Dry skin. Skin rash/inflammation. Headache. Disturbed tactile sensibility. Visual disturbances. Sleeplessness. Gastrointestinal complaints. Cardiac and blood circulation effects.

4.3. Immediate medical attention and special treatment, if necessary

Immediately after ingestion, give a glass of strong drink, beer or wine to drink. Hospitalize at once for treatment with the right antidotes.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Quick-acting ABC powder extinguisher. Quick-acting BC powder extinguisher. Quick-acting class B foam extinguisher. Quick-acting CO2 extinguisher. Class B foam (alcohol-resistant). Water spray if puddle cannot expand.

Unsuitable extinguishing media : Water (quick-acting extinguisher, reel); risk of puddle expansion. Water; risk of puddle expansion.

5.2. Specific hazards arising from the chemical

Fire hazard : DIRECT FIRE HAZARD. Highly flammable liquid and vapour. Gas/vapor flammable with air within explosion limits. INDIRECT FIRE HAZARD. May be ignited by sparks.

Explosion hazard : DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard".

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : No flames, no sparks. Eliminate all sources of ignition. No naked lights. No smoking. Dike and contain spill.

6.1.1. For non-emergency personnel

Protective equipment : Gas-tight suit.

Emergency procedures : Keep upwind. Mark the danger area. Consider evacuation. Close doors and windows of adjacent premises. Stop engines and no smoking. No naked flames or sparks. Spark- and explosion-proof appliances and lighting equipment. Keep containers closed. Wash contaminated clothes.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Stop leak if safe to do so. Ventilate area.

6.2. Environmental precautions

Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

For containment : Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Measure the concentration of the explosive gas-air mixture. Dilute combustible/toxic gases/vapours with water spray. Take account of toxic/corrosive precipitation water. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills.

Methods for cleaning up : Take up liquid spill into a non combustible material e.g.: sand, earth, vermiculite slaked lime or soda ash. Scoop absorbed substance into closing containers. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Measure the concentration in the air regularly. Work under local exhaust/ventilation. Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Handle uncleaned empty containers as full ones. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Keep container tightly closed.

Hygiene measures : Do not eat, drink or smoke when using this product. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Incompatible products : Strong oxidizers. Strong bases. Strong acids. Acid anhydrides. Acid chlorides.

Incompatible materials : Direct sunlight. Heat sources. Sources of ignition.

Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: combustible materials. oxidizing agents. strong acids. (strong) bases. halogens. amines. water/moisture.

Storage area : Store in a cool area. Store in a dry area. Keep container in a well-ventilated place. Fireproof storeroom. Keep locked up. Provide for a tub to collect spills. Provide the tank with earthing. Unauthorized persons are not admitted. Aboveground. Meet the legal requirements.

Special rules on packaging : SPECIAL REQUIREMENTS: closing. dry. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

Packaging materials : SUITABLE MATERIAL: steel. stainless steel. iron. glass. MATERIAL TO AVOID: lead. aluminium. zinc. polyethylene. PVC.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Methanol (67-56-1)		
ACGIH	ACGIH TWA (ppm)	200 ppm
ACGIH	ACGIH STEL (ppm)	250 ppm
NIOSH	NIOSH REL (TWA) (mg/m³)	250 mg/m³
NIOSH	NIOSH REL (TWA) (ppm)	200 ppm
NIOSH	NIOSH REL (STEL) (mg/m³)	325 mg/m³
NIOSH	NIOSH REL (STEL) (ppm)	250 ppm
NIOSH	Remark (NIOSH)	Skin

8.2. Appropriate engineering controls

Appropriate engineering controls : Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure. Keep concentrations well below lower explosion limits.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Safety glasses. Protective clothing. Gloves. Full protective flameproof clothing. Face shield.

Materials for protective clothing:

GIVE GOOD RESISTANCE: polyethylene/ethylenevinylalcohol. styrene-butadiene rubber. viton. GIVE LESS RESISTANCE: chloroprene rubber. chlorinated polyethylene. natural rubber. nitrile rubber/PVC. GIVE POOR RESISTANCE: leather. neoprene. nitrile rubber. polyethylene. PVA. PVC. polyurethane

Hand protection:

Protective gloves against chemicals (EN 374)

Eye protection:

Safety glasses

Skin and body protection:

Head/neck protection. Protective clothing

Respiratory protection:

Full face mask with filter type AX at conc. in air > exposure limit. High vapour/gas concentration: self-contained respirator

Personal protective equipment symbol(s):

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Liquid.
Color	:	Colourless
Odor	:	Characteristic odour Mild odour Pleasant odour Alcohol odour Commercial/unpurified substance: irritating/pungent odour
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	-97.8 °C
Freezing point	:	No data available
Boiling point	:	64.7 °C (1013 hPa)
Critical temperature	:	240 °C
Critical pressure	:	79547 hPa
Flash point	:	9.7 °C (Closed cup, 1013 hPa, EU Method A.9: Flash-Point)
Relative evaporation rate (butyl acetate=1)	:	4.1
Relative evaporation rate (ether=1)	:	6.3
Flammability (solid, gas)	:	No data available
Vapor pressure	:	128 hPa (20 °C)
Vapor pressure at 50 °C	:	552 hPa
Relative vapor density at 20 °C	:	1.1
Relative density	:	0.79 – 0.80 (20 °C)
Relative density of saturated gas/air mixture	:	1
Specific gravity / density	:	790 – 800 kg/m³ (20 °C)
Molecular mass	:	32.04 g/mol
Solubility	:	Soluble in water. Soluble in ethanol. Soluble in ether. Soluble in acetone. Soluble in chloroform. Water: 100 g/100ml (20 °C) Ethanol: complete Ether: complete Acetone: complete
Log Pow	:	-0.77 (Experimental value)
Auto-ignition temperature	:	455 °C (1013 hPa, DIN 51794: Self-ignition temperature)
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	0.544 – 0.59 mPa·s (25 °C)
Explosion limits	:	5.5 – 36.5 vol %
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

Minimum ignition energy	:	0.14 mJ
Saturation concentration	:	166 g/m³
VOC content	:	100 %
Other properties	:	Clear. Hygroscopic. Volatile. Neutral reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity

Violent to explosive reaction with (some) metal powders and with (strong) oxidizers. Violent exothermic reaction with (some) acids and with (some) halogens compounds.

10.2. Chemical stability

Hygroscopic.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Direct sunlight. High temperature. Incompatible materials. Open flame. Sparks. Overheating.

10.5. Incompatible materials

Strong oxidizers. Strong bases. Strong acids. Peroxides. Acid anhydrides. Acid chlorides.

10.6. Hazardous decomposition products

Carbon dioxide. Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Toxic if swallowed.

Acute toxicity (dermal) : Toxic in contact with skin.

Acute toxicity (inhalation) : Toxic if inhaled.

Methanol (67-56-1)	
LD50 oral rat	1187 – 2769 mg/kg body weight (BASF test, Rat, Male / female, Weight of evidence, Aqueous solution, Oral, 7 day(s))
LD50 dermal rabbit	17100 mg/kg (Rabbit, Inconclusive, insufficient data, Dermal)
LC50 inhalation rat (mg/l)	128.2 mg/l air (BASF test, 4 h, Rat, Male / female, Experimental value, Inhalation (vapours))
ATE US (oral)	100 mg/kg body weight
ATE US (dermal)	300 mg/kg body weight
ATE US (gases)	700 ppmV/4h
ATE US (vapors)	3 mg/l/4h
ATE US (dust, mist)	0.5 mg/l/4h

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : Causes damage to organs (liver, kidneys, central nervous system, optic nerve) (Dermal, oral).

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

Viscosity, kinematic : No data available

Potential Adverse human health effects and symptoms : Toxic in contact with skin. Toxic if swallowed. Toxic if inhaled.

Symptoms/effects after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Coughing. Symptoms similar to those listed under ingestion.

Symptoms/effects after skin contact : Symptoms similar to those listed under ingestion.

Symptoms/effects after eye contact : Redness of the eye tissue. Lacrimation.

Symptoms/effects after ingestion : Nausea. Vomiting. AFTER ABSORPTION OF LARGE QUANTITIES: FOLLOWING SYMPTOMS MAY APPEAR LATER: Change in the blood composition. Headache. Feeling of weakness. Abdominal pain. Muscular pain. Central nervous system depression. Dizziness. Mental confusion. Drunkenness. Coordination disorders. Disturbed motor response. Disturbances of consciousness. Visual disturbances. Blindness. Respiratory difficulties. Cramps/uncontrolled muscular contractions.

Chronic symptoms : Red skin. Dry skin. Skin rash/inflammation. Headache. Disturbed tactile sensibility. Visual disturbances. Sleeplessness. Gastrointestinal complaints. Cardiac and blood circulation effects.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.

Ecology - air : Not included in the list of substances which may contribute to the greenhouse effect (IPCC). Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014). Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

Ecology - water : Not harmful to crustacea. Not harmful to fishes. Groundwater pollutant. Inhibition of activated sludge. Nitrification of activated sludge is inhibited. Not harmful to algae. Not harmful to bacteria.

Methanol (67-56-1)	
LC50 fish 1	15400 mg/l (EPA 660/3 - 75/009, 96 h, Lepomis macrochirus, Flow-through system, Fresh water, Experimental value, Lethal)
EC50 Daphnia 1	18260 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 96 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, Locomotor effect)
ErC50 (algae)	22000 mg/l (OECD 201: Alga, Growth Inhibition Test, 96 h, Pseudokirchneriella subcapitata, Static system, Fresh water, Experimental value)

12.2. Persistence and degradability

Methanol (67-56-1)	
Persistence and degradability	Readily biodegradable in the soil. Readily biodegradable in water.
Biochemical oxygen demand (BOD)	0.6 – 1.12 g O_2/g substance
Chemical oxygen demand (COD)	1.42 g O_2/g substance
ThOD	1.5 g O_2/g substance

12.3. Bioaccumulative potential

Methanol (67-56-1)	
BCF fish 1	1 – 4.5 (72 h, Cyprinus carpio, Static system, Fresh water, Experimental value)
Log Pow	-0.77 (Experimental value)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

12.4. Mobility in soil

Methanol (67-56-1)	
Surface tension	0.023 N/m (20 °C)
Log Koc	0.088 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Ecology - soil	Highly mobile in soil.

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Do not discharge into drains or the environment. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Incinerate under surveillance with energy recovery. Obtain the consent of pollution control authorities before discharging to wastewater treatment plants.

Additional information : Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description	:	UN1230 Methanol, 3, II
UN-No.(DOT)	:	UN1230
Proper Shipping Name (DOT)	:	Methanol
Transport hazard class(es) (DOT)	:	3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Packing group (DOT)	:	II - Medium Danger
Hazard labels (DOT)	:	3 - Flammable liquid

DOT Packaging Non Bulk (49 CFR 173.xxx)	:	202
DOT Packaging Bulk (49 CFR 173.xxx)	:	242
DOT Symbols	:	D - Proper shipping name for domestic use only, or to and from Canada
DOT Special Provisions (49 CFR 172.102)	:	IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized. T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3) TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	150
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	60 L
DOT Vessel Stowage Location	:	B - (i) The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ‘‘On deck only’’ on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
DOT Vessel Stowage Other	:	40 - Stow ‘‘clear of living quarters’’
Other information	:	No supplementary information available.

Transportation of Dangerous Goods

Transport document description	:	UN1230 METHANOL, 3 (6.1), II
UN-No. (TDG)	:	UN1230
Proper Shipping Name (Transportation of Dangerous Goods)	:	METHANOL
TDG Primary Hazard Classes	:	3 - Class 3 - Flammable Liquids
Packing group	:	II - Medium Danger
TDG Subsidiary Classes	:	6.1
TDG Special Provisions	:	43 - Despite section 2.1 of Part 2, Classification, these dangerous goods are assigned to this classification based on human experience.
Explosive Limit and Limited Quantity Index	:	1 L
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	1 L

Transport by sea

Transport document description (IMDG)	:	UN 1230 methanol, 3 (6.1), II

UN-No. (IMDG)	:	1230
Proper Shipping Name (IMDG)	:	methanol
Class (IMDG)	:	3 - Flammable liquids
Packing group (IMDG)	:	II - substances presenting medium danger
Subsidiary risks (IMDG)	:	6.1 - Toxic substances
EmS-No. (1)	:	F-E
EmS-No. (2)	:	S-D
MFAG-No		19

Air transport

Transport document description (IATA)	:	UN 1230 Methanol, 3 (6.1), II
UN-No. (IATA)	:	1230
Proper Shipping Name (IATA)	:	Methanol
Class (IATA)	:	3 - Flammable Liquids
Packing group (IATA)	:	II - Medium Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

Methanol (67-56-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	5000 lb
SARA Section 311/312 Hazard Classes	Physical hazard - Flammable (gases, aerosols, liquids, or solids) Health hazard - Acute toxicity (any route of exposure) Health hazard - Specific target organ toxicity (single or repeated exposure)

15.2. International regulations

CANADA

Methanol (67-56-1)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations
No additional information available

National regulations
No additional information available

15.3. US State regulations

Methanol (67-56-1)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	Yes
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date	:	03/08/2019

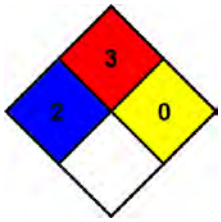
Full text of H-phrases: see section 16:

H225	Highly flammable liquid and vapour
H301	Toxic if swallowed
H311	Toxic in contact with skin
H331	Toxic if inhaled
H370	Causes damage to organs

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA fire hazard : 3 - Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F. as well as liquids with flash points between 73 F and 100 F. (Classes IB & IC)

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection : H

H - Splash goggles, Gloves, Synthetic apron, Vapor respirator

SDS US ValTech

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.

Safety Data Sheet

Effective date: 11 May 2020 **Revision** : 11 May 2020

Trade Name: Liquinox®

1 Identification of the substance/mixture and of the supplier

1.1 GHS Product identifier

Trade Name: Liquinox®
Product number: 1201, 1201-1, 1205, 1215, 1230, 1232, 1232-1, 1255

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

1.2.1 Recommended dilution ratio: 1 - 2% in water

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer:

Alconox Inc.
30 Glenn St
White Plains, NY 10603
(914) 948-4040

Supplier:

Emergency telephone number:
ChemTel Inc
North America: 1-888-255-3924
International: +1 813-248-0573

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272, 29CFR1910/1200 and GHS requirements.

Hazard-determining components of labeling:
Alcohol ethoxylate
Sodium alkylbenzene sulfonate
Sodium xylenesulphonate
Lauramine oxide

2.2 Label elements:

Eye damage, category 1.
Skin irritation, category 2.

Product at recommended dilution:

Eye irritation, category 2B

Hazard pictograms:

Signal word: Danger

Hazard statements:
H315 Causes skin irritation.
H318 Causes serious eye damage.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

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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.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P501 Dispose of contents and container as instructed in Section 13.

Hazardous Elements at Use Dilution:

Hazard pictograms:

Signal word: Warning

Hazard statements:

H320 Causes eye irritation

Precautionary statements:

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.
P501 Dispose of contents and container as instructed in Section 13

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): May cause surfaces to become slippery. Use caution in areas of foot traffic if on floors.

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, 29CFR1910/1200 and GHS, 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: 68081-81-2 or 68411-30-3	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Dam. 1; H318	10-25
CAS number: 1300-72-7	Sodium Xylenesulphonate	Eye Irrit. 2;H319	2.5-10
CAS number: 84133-50-6	Alcohol Ethoxylate	Skin Irrit. 2 ; H315 Eye Dam. 1; H318	2.5-10
CAS number: 1643-20-5	Lauramine oxide	Skin Irrit. 2 ; H315 Eye Dam. 1; H318	1-2

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At use dilution:

	CAS number: 68081-81-2 or 68411-30-3	Sodium Alkylbenzene Sulfonate	Eye Irr. 2B; H319	0.1-0.25

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.

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.

First aid measure at recommended dilution:

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.

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.

After swallowing:
Rinse mouth thoroughly. Seek medical attention if irritation, discomfort, or vomiting develops.

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Trade Name: Liquinox®

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.

8 Exposure controls/personal protection

8.1 Control parameters :

25322-68-3, Poly(ethylene oxide), AIHA TWA 10 mg/m3 (<0.15% present in concentrate)

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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.

Exposure Control and Personal Protective Equipment at recommended dilution:

Under normal use and operational conditions, no special personal protective equipment or engineering controls will be necessary. Handle with care.

9 Physical and chemical properties

Appearance (physical state, color):	Pale yellow liquid	**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:	8.5 (as is)	**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.
Flammability (solid, gaseous):	Not flammable	**Viscosity**:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	1.08 g/mL		

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10 Stability and reactivity

10.1 Reactivity: Not determined or not available.
10.2 Chemical stability: Not determined or not available.
10.3 Possibility hazardous reactions: Not determined or not available.
10.4 Conditions to avoid: Not determined or not available.
10.5 Incompatible materials: Not determined or not available.
10.6 Hazardous decomposition products: Not determined or not available.

11 Toxicological information

11.1 Information on toxicological effects:

Acute Toxicity:

Oral:

: LD50 >5000 mg per kg (Rat, Oral) - product.

Chronic Toxicity: No additional information.

Skin corrosion/irritation (raw materials):

Alcohol Ethoxylate: May cause mild to moderate skin irritation.

Sodium Alkylbenzene Sulfonate: Causes skin irritation.

Lauramine oxide: Causes skin irritation.

Serious eye damage/irritation (raw materials):

Sodium Alkylbenzene Sulfonate: Causes serious eye damage.

Alcohol Ethoxylate: Causes moderate to severe eye irritation and conjunctivitis.

Sodium xylenesulphonate: irritating to eyes.

Lauramine oxide: Causes serious eye damage.

Product information at recommended dilution:

Eye irritation may occur upon direct contact with eyes. No specific hazards for skin contact, inhalation, or chronic exposure are expected within normal use parameters.

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.

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12 Ecological information

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.9 mg/l, 48 hours. Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Lauramine oxide: Fish, LC50 24.3 mg/l, 96h [Killifish (Cyprinodontidae)]
Lauramine oxide: Aquatic invertebrates, (LC50): 3.6 mg/l 96 hours [Daphnia (Daphnia)].
Lauramine oxide: Aquatic plants, EC50 Algae 0.31 mg/l 72 hours [Algae]
Alcohol Ethoxylate: Aquatic invertebrates, (LC50): 4.01 mg/l 48 hours [Daphnia (daphnia)].

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:** **Label:** **LTD. QTY:**	None None None
US DOT **Limited Quantity Exception:**	None

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

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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.

EU

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

Germany MAK: Not classified.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H318 Causes serious eye damage.

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.
P332+P313 If skin irritation occurs: Get medical advice/attention.
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
HMIS: 1-0-0

At recommended dilution:

NFPA: 1-0-0
HMIS: 1-0-0