

SUBMITTED TO:
PDC, Inc. Engineers
1028 Aurora Drive
Fairbanks, Alaska 99709



BY:
Shannon & Wilson, Inc.
2355 Hill Road
Fairbanks, Alaska

(907) 479-0600
www.shannonwilson.com

FINAL

2020 HAZARDOUS MATERIALS ASSESSMENT WORK PLAN
Cordova Airport Combined
Maintenance Facility
CORDOVA, ALASKA



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Submitted To: PDC, Inc. Engineers
1028 Aurora Drive
Fairbanks, Alaska 99709
Attn: William Hrinko, P.E., S.E.

Subject: FINAL 2020 HAZARDOUS MATERIALS ASSESSMENT WORK PLAN,
CORDOVA AIRPORT COMBINED MAINTENANCE FACILITY,
CORDOVA, ALASKA

The services we propose in this Work Plan will be conducted on behalf of PDC, Inc. Engineers for the Alaska Department of Transportation & Public Facilities (DOT&PF). Our scope of services was specified in our proposal dated August 18, 2019 and approved by Amendment 5 of our professional services agreement. As a courtesy to the Alaska Department of Environmental Conservation (ADEC), we recommend the DOT&PF submits this work plan to them.

This Work Plan was prepared and reviewed by:

FOR Rachel Willis
Environmental Scientist
Role: Author

Valerie Webb, CPG
Associate
Role: Project Manager

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Important Information

ACRONYMS

AAC	Alaska Administrative Code
ACM	Asbestos containing materials
ADEC	Alaska Department of Environmental Conservation
AHERA	Asbestos Hazard Emergency Response Act
ARFF	Aircraft Rescue and Fire Fighting Building
bgs	below ground surface
CAA	Civil Aeronautics Association
Cordova Airport	Cordova Merle K. Smith Airport
CS	Contaminated Sites Database
CSM	Conceptual Site Model
DOT&PF	Department of Transportation and Public Facilities
DRO	diesel range organics
DQO	data quality objective
EMSL	EMSL Laboratories, Inc.
EPA	Environmental Protection Agency
°F	Fahrenheit
FAA	Federal Aviation Administration
GeoTek	GeoTek Alaska, Inc.
GRO	Gasoline Range Organics
LDRC	laboratory data review checklist
LBP	Lead-based paint
mL	milliliters
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PID	photoionization detector
PLM	polarized-light microscopy
QA	Quality Assurance
QC	Quality Control
SGS	SGS North America, Inc.
SVOC	semi-volatile organic compounds
RRO	residual range organics
SREB	Snow Removal Equipment Building
SSHP	Site Safety and Health Plan
UST	underground storage tank
VOC	volatile organic compound

1 INTRODUCTION

This Work Plan describes our proposed approach for hazardous waste assessment activities at the Cordova Merle K. Smith Airport (Cordova Airport). We understand the Alaska Department of Transportation and Public Facilities (DOT&PF) plans to demolish the existing Aircraft Rescue and Fire Fighting Building (ARFF) at the Cordova Airport and build a combined Maintenance Facility to include a Snow Removal Equipment Building (SREB) and new ARFF. The Cordova Airport is located near multiple Alaska Department of Environmental Conservation (ADEC)-listed contaminated sites.

We have prepared this Work Plan in general accordance with ADEC's March 2017 *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites*. We will conduct these activities in general accordance with ADEC's October 2019 Field Sampling Guidance document, and our Site Safety and Health Plan (SSHP) presented in Appendix A.

1.1 Project Objectives

The project objectives are to characterize potentially hazardous materials on the grounds and in existing buildings where construction activities for the future Maintenance Facility will occur.

The project scope includes the following tasks:

- Conduct a hazardous materials assessment of the ARFF structure to be demolished.
- Collect samples of suspect material for analysis of asbestos containing materials (ACM) and lead-based paint (LBP) to submit to EMSL Laboratories, Inc. (EMSL).
- Visually assess the building for additional suspect hazardous materials.
- Collect soil samples from subsurface drilling activities to assess hazardous materials within the subsurface.
- Submit analytical soil samples to SGS North America, Inc. (SGS) for analysis of gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and mercury.
- Review and evaluate analytical data.
- Prepare a report detailing our findings.
- Provide 35-percent design plans and specifications as requested for the demolition of the existing ARFF structure and septic system.

Our subsurface investigation will occur alongside the geotechnical drilling activities. Soil boring locations will be selected based on the needs of the geotechnical effort, and we will combine the geotechnical and environmental drilling activities into one mobilization effort.

In our summary report we will include soil-borings analytical results, figures depicting sample locations, a hazardous materials assessment, conclusions for the site, and recommendations for waste disposal. Our scope of services does not include complete characterization or delineation of potential contamination. The results of the work described above will be used during development of the 35-percent facility design.

1.2 Project Team

The project team and their associated responsibilities are summarized in Exhibit 1-1 below. Chris Darrah will be Shannon & Wilson's Principle-in-Charge and Asbestos Hazard Emergency Response Act (AHERA)-certified building inspector and is responsible for conducting the hazardous materials sampling and observation within the building. Kyle Brennan will oversee Shannon & Wilson's geotechnical subsurface explorations. Valerie Webb will serve as the Project Manager and site safety officer, leading Shannon & Wilson's field activities and maintaining Shannon & Wilson safe work practices.

Exhibit 1-1: Project Team

Member	Responsibility	Representative	Contact Number
ADOT&PF	Parent/Owner	Lauren Staff, PE	907-451-5424
PDC, Inc. Engineers	Client	William Hrinko, PE	907-222-1112
ADEC	Regulator, Project Manager	Bill O'Connell	907-269-3057
Shannon & Wilson, Inc.	Principal-in-Charge and AHERA-certified building inspector	Chris Darrah, CPG, CPESC	907-458-3143
	Geotechnical Lead	Kyle Brennan, PE	907-433-3219
	Project Manager	Valerie Webb, CPG	907-458-3152
SGS	Analytical Laboratory Services	Jen Dawkins	907-474-8656
EMSL Laboratories, Inc.	Asbestos Analytical Services	Natalie Murphy	856-303-3430
GeoTek Alaska, Inc.	Drilling Subcontractor	Scott Vojta	907-596-5900

1.3 Project Schedule

We will coordinate with our drilling subcontractor to perform the proposed explorations once we receive ADEC approval of our work plan. We anticipate the field activities described in this work plan will be completed in the summer 2020, with reporting to be

completed within 45 days from receiving the final laboratory report. We will request laboratory reports with standard two-week turnaround time from SGS and one-week turnaround time from EMSL.

2 SITE DESCRIPTION AND BACKGROUND

The Merle K. Smith Airport is located east of the community of Cordova, Alaska at mile 13 of the Copper River Highway (60.4933° North, 145.4683° West). Cordova is located at the southeastern end of the Prince William Sound in the Gulf of Alaska near the mouth of the Copper River. The airport is located within Sections 7 and 18, Township 16 South, Range 1 West, and Section 12, Township 16 South, Range 2 West, Copper River Meridian. Access to the community is only by air and sea. A map of the general vicinity is presented in Figure 1.

We understand the DOT&PF plans to demolish the existing ARFF building and build a combined maintenance facility in a portion of the old ARFF building footprint (Figure 2). Our client, PDC Inc. Engineers, suspects the ARFF building may contain asbestos and LBP and has requested Shannon & Wilson's services to conduct a hazardous waste assessment for the ARFF building.

2.1 Site Background

The Cordova Airport belonged to the Federal Aviation Administration (FAA) and Civil Aeronautics Administration (CAA) until 1966, when property ownership transferred to the State of Alaska. During the 1940's, the property was used as a camp and storage for fuel, aircraft, and ammunition, and was reverted to include control towers, airplane hangars, and multiple underground storage tanks (USTs). Most facilities from the FAA and CAA ownership era have been removed from the site. ADEC contaminated sites (CS) at the airport are described briefly below. The ADEC CS Database lists thirteen FAA sites from the excavation of multiple gasoline and heating oil USTs excavated in 1994. The sites are listed as "cleanup complete" or "cleanup complete with institutional controls" (*ADEC File Number 2215.38.001*).

There is evidence of an abandoned UST located on the east side of the current ARFF building and injection wells outside on the west side of the building, as documented in PDC's *Site Visit Report* from August 2018. The Cordova Airport is served by a single water-supply well installed in 2001, and static water was observed at 10 feet below ground surface (bgs).

3 CONTAMINANTS OF POTENTIAL CONCERN AND REGULATORY LEVELS

3.1 COPCs in Soil

The primary contaminants of potential concern (COPCs) are GRO, DRO, RRO, VOCs, PAHs, and mercury. To evaluate soil analytical data, we will compare soil-gas sample results to the regulatory cleanup levels listed in the ADEC 18 Alaska Administrative Code (AAC) 75.341 Tables B1 Method Two- *Soil Cleanup Levels (Over 40-inch zone, Migration to Groundwater)* and Table B2 Method Two- *Petroleum Hydrocarbon Cleanup Levels (Over 40-inch zone)*. We consider the COPCs listed in Exhibit 3-1 to be contaminants with potential pathways affecting human health and the environment and are regulated under 18 AAC 75. We have included safety data sheets for asbestos, lead, methanol and petroleum related COPCs anticipated to be present in our Site Safety and Health Plan (Appendix A).

Exhibit 3-1: Contaminants of Potential Concern and Regulatory Levels

Contaminant	Analytical Method	Soil Regulatory Level (mg/kg)
GRO	AK 101	260
DRO	AK 102	230
RRO	AK 103	9700
VOCs	EPA 8260	Analyte Dependent
PAH	EPA 8270D-SIM	Analyte Dependent
Mercury	SW 6020A	0.36

Note:

Soil cleanup levels are from 18 AAC 75 Table B1 Method Two – Soil Cleanup Levels (Migration to Groundwater) and Table B2 Method Two – Petroleum Hydrocarbon Cleanup Levels (Over 40-inch Zone)

mg/kg—milligrams per kilogram

3.2 Hazardous Materials Assessment Contaminants

The suspect hazardous materials we are sampling in the building ARFF building is summarized in Exhibit 3-2. We will also be completing visual inspections for evidence of polychlorinated biphenyl- (PCB) containing oil in fluorescent lighting, mercury containing thermostats, and radioactive material in exit signs using a radiation monitor. We will evaluate the presence of ACM and LBP based on the analytical results provided by the laboratory.

Exhibit 3-2: Hazardous Materials Assessment Contaminants

Contaminant	Analytical Method	Laboratory	Laboratory Reporting limit
Asbestos	EPA 600	EMSL	1%
Lead	EPA SW 6020A		5000 mg/kg or 0.5%

Note:
mg/kg—milligrams per kilogram; EPA—Environmental Protection Agency

4 PRELIMINARY CONCEPTUAL SITE MODEL

We completed preliminary conceptual site model (CSM) for the site based on our current understanding of the site conditions (Appendix B). The following is a summary of the CSM and the transport mechanisms, exposure media, exposure pathways, and potential receptors it describes.

4.1 Description of Potential Receptors

We consider commercial/industrial workers, construction workers, site visitors, and trespassers to be potential receptors. We do not consider residents, recreations users, subsistence harvesters/consumers or farmers to be potential receptors. We will not consider off-site residences to be receptors unless there is evidence of contamination leaving the Cordova Airport property.

4.2 Potential Exposure Pathways

4.2.1 Direct Contact with Soil

Dermal absorption and direct ingestion may be potential direct-contact exposure pathways for soil. Direct contact is unlikely at the present for subsurface soil, but future construction work at the site may result in dermal contact or ingestion of soil by commercial workers, site visitors, and/or construction workers.

4.2.2 Direct Contact with Groundwater

Dermal absorption of contaminants may be a potential exposure pathway for groundwater. We expect groundwater to be present 10 to 15 feet bgs. Commercial workers, site visitors, and/or construction workers may be exposed to contaminated groundwater through dermal absorption or incidental ingestion during construction activities.

4.2.3 Inhalation

Inhalation of indoor and outdoor air may be a potential exposure pathway since compounds from diesel can volatilize from the subsurface. Subsurface soil may be excavated and brought to the surface during construction activities, potentially exposing receptors to volatile contaminants in outdoor air.

5 SAMPLING AND ANALYSIS PLAN

This section describes our field-screening and analytical sampling approach to investigate hazardous materials in the subsurface. Efforts for the drilling activities will coincide with the geotechnical explorations. The proposed soil borings are presented in Figure 2.

5.1 Utility Locates

We will request utility locates prior to drilling activities. Proposed sampling locations may need to be modified based on the results of utility locates; we understand there are multiple subsurface pipes, electrical lines, and other utilities in the area.

5.2 Soil Borings

We will contract with GeoTek Alaska, Inc. (GeoTek) to advance eight soil borings within the project area using a rubber track-mounted Geoprobe® hollow-stem auger drill rig. GeoTek will drill five borings within the building footprint and three borings in the apron pavement areas around the building. One soil boring in the building footprint will be advanced to approximately 50 feet bgs, and three borings will be advanced to 30 feet bgs. The three borings in the pavement will be advanced to 15 feet bgs. Boring depths have been selected based on geotechnical exploration needs.

The approximate locations of the borings will be determined in the field prior to explorations to be as close to the proposed improvements as possible, avoid buried utilities, and not disrupt area operations. We will coordinate with the DOT&PF team and airport operations to select final boring locations and access permission from the FAA and/or NOTAMs. Approximate locations are presented in Figure 2.

During drilling we will log soil types, field-screen soils with a photoionization detector (PID), and select soil samples for laboratory analysis. We will visually classify soil cores in accordance with the American Society for Testing and Materials *Standard Practice for Description and Identification of Soils* (ASTM D2488-06).

PID-headspace samples will be collected from each retrieved soil core at approximate 1-foot intervals and within the first six inches above the groundwater table. We will collect up to two analytical soil samples from each soil boring based on PID field-screening results. We will collect two soil samples in each boring. One sample will be collected from the soil interval with the highest PID reading, and one sample will be collected at the interval above the water table.

5.2.1 PID Field Screening

We will use a hand-held MiniRae® 3000 PID manufactured by RAE Systems or equivalent PID to check for the possible presence of hydrocarbons in soil-boring core samples. The PID measures total volatile compounds present as vapors, which is a semi-quantitative indication of hydrocarbons present. The detector will be calibrated daily, or more often as needed, to a 100-ppm isobutylene standard according to manufacturer's instructions. Shannon & Wilson field personnel are trained and experienced in calibration, operation, routine maintenance, and troubleshooting of the PID, as well as interpretation of PID results.

5.2.2 Headspace Methodology

We will collect one PID field-screening sample per two feet of each recovered soil-boring core, and one field-screening sample within the first six inches above the groundwater table. We will collect PID field-screening samples from soil cores immediately after retrieval using the procedures summarized below.

We will retrieve headspace samples using a clean, stainless-steel spoon from freshly uncovered soil and place the soil in a clean, sealable plastic bag, filling it one-third to one-half full and quickly sealing it closed. Headspace samples will maintain within our custody, and we will screen the headspace samples within one hour of collection.

We will allow the headspace to develop in the bag by warming it to at least 40 degrees Fahrenheit (°F) for 10 minutes to one hour and shaking the bag for 15 seconds at the beginning and end of the period to assist volatilization.

We will insert the PID probe into the bag, taking care to avoid uptake of water droplets and soil particles. We will record the maximum PID reading obtained, noting any erratic meter response at high-organic-vapor concentrations or conditions of elevated headspace moisture.

5.2.3 Soil Sampling Procedures

We will wear a new pair of disposable nitrile gloves during the collection and handling of each soil sample to prevent cross-contamination. We will collect each sample using a new, stainless-steel spoon. We will collect grab samples from each sampling location and will not collect samples as composites or homogenize the samples.

We will collect soil samples for GRO and VOC analysis with the following procedure:

- Using a clean, stainless-steel spoon, place approximately 50 grams of soil into the pre-weighed, 4-ounce, amber-glass sample jar provided by the laboratory.
- Carefully add 25 milliliters (mL) of methanol to the jar.
- Use a clean paper towel to remove soil from the threads of the sample containers and caps, as needed.
- Use waterproof ink to complete the sample label attached to the jar by the laboratory (do not place a label, tape, or other material on the sample jar).
- Seal the jar and place into the sample cooler with frozen ice substitute.

We will collect soil samples for the DRO, RRO, PAH, and mercury analyses by completely filling the laboratory supplied jars. We will collect soil samples into laboratory-provided containers in order of decreasing volatility (i.e. GRO, then DRO/PAHs). Sample depths, field-screening results, and encountered soils will be recorded on a standard Shannon & Wilson Boring Log (Appendix C).

5.3 Surface Soil

We will conduct a visual inspection of the surface soil surrounding the SREB. If we observe staining or other visible signs of contamination, we will collect field-screening samples. We will collect headspace samples from the surface to 6 inches bgs using a clean stainless-steel spoon. We will place the soil in a clean, sealable plastic bag and measure the headspace, as described in Section 5.2.2.

If field screening results from the PID are above 20 ppm, we will collect an analytical surface soil sample for GRO, DRO, RRO, and VOCs analysis.

5.4 Hazardous Materials Inventory and Sampling

An AHERA-certified building inspector will visit the ARFF building to perform a survey of building materials. We will observe and document materials, including suspect hazardous materials, used throughout the facility. Our report will include a photograph log of

suspected hazardous materials and sampling locations. We will not make repairs of the sample locations.

5.4.1 Asbestos Containing Materials (ACM)

During the building observation and survey, an AHERA-certified building inspector, or a representative working under an AHERA-certified building inspector, will collect up to 50 samples for analysis for asbestos. The sampler will remove a sample of suspect hazardous material and store the sample in a quart-sized sealable plastic bag. The sampler will take photos of the sample location and provide a written description of the type of sample and location. We will follow EPA method requirements for collection of bulk material samples by PLM, outlined below:

- Enough material should be included in each sample to be representative of the material of interest.
- Floor tile, roofing material, and similar samples should have 3 to 4-inches squared (in²) of surface area.
- Ceiling tile, loose fill insulation, and similar material samples should have a surface area of 1-in².
- Samples that have a thin-coating materials, such as paints, spray plasters, tapes, etc. can have a smaller sample size.
- We will avoid sampling materials covered in soil or saturated with moisture, as they can affect the analytical process.
- We will also collect samples that appear to be homogenous.

5.4.2 Lead-Based Paint (LBP)

The Shannon & Wilson sampler will observe and document paint used throughout the building. The sampler will collect up to 20 paint samples from surfaces in the building using a paint scraper, knife, or other tool. Paint will be collected in a quart-sized sealable plastic baggie and include enough paint chips to cover the bottom of the bag. We will log LBP samples in a sample collection form (Appendix C) and provide photos of the location in a photo log within the summary report.

6 FIELD AND LABORATORY QUALITY-CONTROL MEASURES

6.1 Data Quality Objectives

This section outlines our data quality objectives (DQOs) for this project based on DQO processes presented in ADEC’s October 2019 Minimum Quality Assurance Requirements for Sample Handling, Reports, and Laboratory Data technical memorandum. The results of our building hazardous material samples and subsurface soil samples will guide our recommendations for continuing monitoring or corrective action, as necessary.

Exhibit 6-1: Quality Assurance Objectives

Matrix	Analyte	Method	Precision	Accuracy	Completeness
Soil	GRO	AK 101	50%	60-120%	85%
	DRO	AK 102	50%	60-120%	85%
	RRO	AK 103	50%	60-120%	85%
	VOCs	EPA SW8260B	50%	(analyte dependent)	85%
	PAHs	EPA 8270D-SIM	50%	(analyte dependent)	85%
	Mercury	EPA 6020A	50%	60-120%	85%
Building Materials	Asbestos	EPA 600	50%	--	85%
	Lead in Paint	EPA SW 6020A	50%	--	85%

6.2 Field Quality Control Measures

The field quality assurance/quality control (QA/QC) program includes trip blanks, temperature blanks, and the collection of field-duplicate samples. We will not collect an equipment blank sample since we will not be using reusable equipment.

6.2.1 Equipment Decontamination

All non-disposable sampling equipment introduced or coming into contact with soil at the site will be decontaminated prior to reuse. Our three-part decontamination process is outline below:

- a thorough non-phosphate detergent wash;
- tap water triple-rinse; and
- distilled water rinse.

6.2.2 Field Instrument Calibration

Field equipment will be calibrated daily, or more often as needed, in accordance with manufacturer instructions. We will document calibrations in the field notes.

6.2.3 Unique ID Number

Samples will be labeled with a unique identifiers, sample-collection date and time, and all analytes requested prior to being placed in a sample cooler.

6.2.4 Temperature Blanks

Analytical soil samples will be placed in a sample cooler containing a temperature blank and artificial ice substitute. We will add ice to maintain an interior cooler temperature within the EPA's specified range of 0 °C to 6 °C (EPA publication SW-846); ADEC has approved this range.

6.2.5 Trip Blanks

We will use trip blanks to detect and quantify organic chemical cross-contamination between samples or contamination originating from an outside source. The laboratory will create one trip-blank set for each medium and each cooler containing sample bottles for volatile organic analyses.

6.2.6 Field Duplicate

In addition to project samples, the field representative will collect and submit field-duplicate samples for laboratory analysis. We will collect duplicate samples at a minimum of 10 percent for soil samples, i.e., a minimum of one field-duplicate per 10 samples collected in the field. Field duplicate samples are not required for LBP and ACM methods; however, we will collect duplicate samples at a minimum of 10 percent for LBP and ACM field samples.

We will collect field-duplicate soil samples by filling an additional set of sample bottles with soil from the selected boring interval, entering the location of the duplicate sample in our sampling log. Field duplicate samples for ACM and LBP samples will be collected by filling an additional bag from the same location as the primary sample. The field-duplicate sample will be submitted blind to the lab and analyzed with the same method as the primary sample.

6.2.7 Chain of Custody, Storage, and Transport

We will maintain custody of the samples at all times prior to submitting them to the laboratory for analysis and document transfer of custody on a chain of custody (COC). The COC records document sample possession from the point of collection to the time of receipt by the laboratory sample-control center. We will keep a copy of the COC record to provide sample accountability between field and laboratory.

During field activities, we will store the samples in a cooler with adequate quantities of ice substitutes to maintain a temperature of 0° C to 6° C. For LBP and ACM samples, ice is not required for sample storage and preservation, and these samples will be stored in separate coolers without ice.

6.2.8 Sample Preservation Methods

The laboratory will supply sample bottles containing the appropriate preservatives as applicable. We will add 25 mL of methanol to the GRO and VOC soil-sample containers immediately after sampling (field extraction). Samples will be kept chilled to a temperature of 0° C to 6° C.

6.3 Laboratory Quality-Control Samples

SGS will perform QC measurements on soil samples to determine precision and accuracy of the entire measurement system, including initial and continuing calibration checks, analysis of method blanks, analysis of spiked samples, duplicate analyses, and evaluation of surrogate-analyte recoveries. Method blank results, spiked sample recoveries, duplicate analyses, and surrogate-recovery data will be included in the laboratory report. The laboratory will apply their in-house procedures for QC reporting

Methods for ACM and LBP do not include laboratory QC samples, method blanks, spiked samples, duplicate samples, and surrogate-analyte recovery samples.

7 INVESTIGATION-DERIVED WASTE

There will likely be excess soil from the soil borings not selected for laboratory analysis. We will contain excess soil, including field-screening headspace soil samples, in 5-gallon buckets until the receipt of analytical results. Excess soil with results below the action level will be disposed of to the ground and excess soil with results above the action level will be disposed of via shipment to a waste disposal facility, yet to be determined, or an equivalent alternative.

Excess material from ACM sampling and LBP sampling will remain on site and disposed of during the SREB building demolition according to federal, state, and local regulation.

Other investigation-derived waste will include non-reusable equipment such as nitrile gloves will be disposed of in the Cordova landfill.

8 FIELD DOCUMENTATION

We will use field log sheets to document field information, including the following:

- date
- sampling team member(s)
- documentation of instrument calibration
- location of activity and site conditions
- GPS coordinates (if used)
- site sketches
- weather and other salient observations
- field observations and comments
- field measurements
- sample ID
- sample date and time
- site photographs
- location of sampling points

We will prepare field activity reports (FARs) for each day we are in the field. Samples of the field activities form and FAR form are included in Appendix C.

9 ANALYTICAL METHODS

We will submit ACM and LBP samples to EMSL in San Leandro, California via FedEx two-day shipping for asbestos analysis with EPA Method 600/R-93/116. EMSL is an American Industrial Hygiene Association certified and National Voluntary Laboratory Accreditation Program laboratory. ACM and LBP samples will be packed in a cooler with COC seals and shipped without a temperature control. Asbestos will be reported as a volume percent, and LBP will be reported in parts per million (ppm).

Exhibit 9-1 summarizes analytes, laboratory methods, sample containers and volumes, and preservation methods for samples.

Exhibit 9-1: Sample Containers, Preservation, and Holding Time Requirements

Matrix	Laboratory	Analyte	Method	Container and Sample Volumes	Preservation	Holding Time
Soil	SGS North America, Inc.	GRO	AK 101	(1) 4-ounce pre-weighted jar with septa	25-mL MeOH, 0 °C to 6 °C	28 days
		DRO	AK 102	(1) 4-ounce amber glass jar	0 °C to 6 °C	14 days to extraction†
		RRO	AK 103	(1) 4-ounce amber glass jar	0 °C to 6 °C	14 days to extraction†
		VOCs	EPA SW 8260B	(1) 4-ounce pre-weighted amber glass jar	25-mL MeOH, 0 °C to 6 °C	14 days to extraction†
		PAHs	EPA 8270D-SIM	(1) 4-ounce amber glass jar	0 °C to 6 °C	14 days to extraction†
		Mercury	EPA SW 6020A	(1) 4-ounce amber glass jar	0 °C to 6 °C	28 days
Various building materials	EMSL	Asbestos	EPA 600/R-93/116	Quart-sized Ziploc	none	none
Paint		Lead in Paint	EPA SW 6020A	Quart-sized Ziploc	none	6 months

NOTES:

Surface soil samples will be analyzed for GRO, DRO, RRO, and VOCs

Soil boring samples will be analyzed for GRO, DRO, RRO, VOCs, PAHs, and Mercury

10 DATA EVALUATION AND REPORTING

The laboratory supervisor or other responsible party will validate the laboratory tests and include an evaluation of the precision and accuracy of the data set. The laboratory QC officer or other responsible party will review and sign off on the analytical data before release. Data reporting will be included in the laboratory reports submitted to Shannon & Wilson. Individual laboratory reports will be included with our final report. We will check analytical data generated by the laboratory for precision, accuracy, and completeness. Data-evaluation procedures will include QA checks to confirm holding times, duplicate samples, and other QA parameters meet data quality objectives. We will also complete the ADEC laboratory data review checklists (LDRCs) as part of our data-review process.

After we have reviewed and evaluated the analytical data, we will prepare a report in which we

- document field activities;

- summarize soil results and evaluate those results in the context of ADEC cleanup levels;
- provide a photo log and written summary of building inventory potentially hazardous materials; and
- summarize LBP and ACM sample results.

Qualified Shannon & Wilson personnel will review field data, including sample descriptions and pertinent observations, during preparation of the report. We will provide a discussion of sample results and recommendations for additional investigation, corrective action, monitoring, or site closure, as appropriate. We will also include laboratory data reports, LDRCs, and copies of COC records with the report.

11 REFERENCES

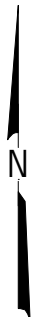
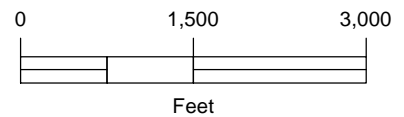
- Alaska Department of Environmental Conservation Spill Prevention and Response, 2017, 18 AAC 75.341 Tables B1 Method Two- *Soil Cleanup Levels (Over 40-inch zone, Migration to Groundwater)* and Table B2 Method Two- *Petroleum Hydrocarbon Cleanup Levels (Over 40-inch zone)*.
- Alaska Department of Environmental Conservation (ADEC), 2019, Field Sampling Guidance: Juneau, Alaska, ADEC Division of Spill Prevention and Response, Contaminated Sites Program, August, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.
- Alaska Department of Environmental Conservation (ADEC), 2017, Guidance on Developing Conceptual Site Models: Juneau, Alaska, ADEC Division of Spill Prevention and Response, Contaminated Sites Program, January, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.
- Alaska Department of Environmental Conservation (ADEC), 2019, Minimum Quality Assurance Requirements for Sample Handling, Reports, and Laboratory Data Technical Memorandum: Juneau, Alaska, ADEC Division of Spill Prevention and Response, Contaminated Sites Program, October, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.
- Alaska Department of Environmental Conservation (ADEC), 2017, Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites: Juneau, Alaska, ADEC Division of Spill Prevention and Response, Contaminated Sites Program, March, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.
- ASTM Standard D24488-06, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures), 2018, ASTM International, West Conshohocken, PA, available www.astm.org.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Project Site
- Project Area



Cordova Airport Hazardous Materials Assessment
Cordova, Alaska

CORDOVA AIRPORT VICINITY MAP

March 2020

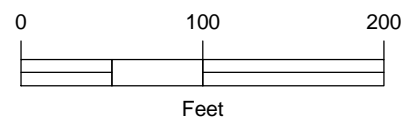
103311-001

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Aircraft Rescue and Fire Fighting building
- ⊕ Proposed Soil Borings
- Underground Storage Tank
- Combined Maintenance Facility



Cordova Airport Hazardous Materials Assessment
Cordova, Alaska

SITE PLAN

March 2020

103311-001

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Figure 2

Appendix A

Site Safety and Health Plan

CONTENTS

- Site Safety and Health Plan
- Safety Data Sheets

SITE SAFETY AND HEALTH PLAN

APPENDIX A: SITE SAFETY AND HEALTH PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN
Cordova Airport Hazardous Materials Assessment
Cordova, Alaska

*This Health and Safety Plan is to be used in conjunction with
Shannon & Wilson's Corporate Health and Safety Program*

INTRODUCTION

This Site-specific Health & Safety Plan (SSHSP) has been prepared for Shannon & Wilson personnel performing project-specific activities for the Cordova Airport Hazardous Materials Assessment in Cordova, Alaska. This plan provides a Job Safety Analysis (JSA) specific to the site and the work to be performed during the project. All field personnel must understand the JSA before going to the site. Acknowledgement that personnel are aware of this SSHSP and the JSA will be documented by signing the Acknowledgement Form included at the back of this document.

Field activities to be performed under this SSHSP include the following: Conduct Hazardous Materials Assessment in the Aircraft Rescue and Fire Fighting building. If field activities other than those noted are performed, this document should be revised. The field activities are anticipated to extend from January 0, 1900 to January 0, 1900.

ORGANIZATION

Shannon & Wilson expects its employees to follow the policies and procedures set forth in the Corporate Health and Safety plan and the specific guidelines included in this SSHSP. Employees at all level of organization are covered by this requirement. In certain cases, deviations to a policy or procedure may be appropriate, but any changes must be justifiable and documented. Changes in this program will only be made with the prior approval of the Site Safety Officer (SSO).

The goal on this project, as on all Shannon & Wilson projects, is to experience zero injuries and to remain in compliance with applicable federal, state, and local health and safety requirements. Personnel accountable for employee's safety and health on this project include the Project Manager (PM), the SSO, and the Health and Safety Officer (HSO). The names and contact numbers for these key personnel for this project are listed below.

Project Manager	Valerie Webb	907-458-3152
Site Safety Officer	Chris Darrah	907-458-3143
Health & Safety Officer	Fawn Glassburn	907-458-3133

JOB HAZARD ANALYSIS

Physical hazards associated with this project are summarized on a JSA worksheet, presented on the following pages. The JSA lists the physical hazards by activity and the safe job practices (engineering, administrative, and personal controls) that should be undertaken to minimize these hazards.

Project Number:	103328	Date:	5-Feb-20
Project Title: Cordova Airport Hazardous Materials Assessment		Prepared By:	Rachel Willis
		Reviewed By:	VEW
Project Location:	Cordova, Alaska	Project Mngr:	Valerie Webb
Brief Description of Field Activities: Conduct Hazardous Materials Assessment in the Aircraft Rescue and Fire Fighting building. Sample 8 soil borings.		Site Safety:	
		Field Staff:	TBD
		Field Start Date:	Summer 2020
		Field End Date:	Summer 2020
Required PPE:	safety glasses, hard hat, high visibility vest, safety toe boots, ear plugs, work gloves		
Required Training:	first aid/CPR, 40-hour HAZWOPR, Hazmat Certification		
Safety Equipment:	First aid kit, Cell phone, Fire extinguisher		
Req'd Plans/Permits:	Site-specific health and safety plan		
Tasks <i>Identify the work activities and steps</i>	Potential Hazards <i>Analyze each work activity for potential hazards</i>	Safe Job Practices <i>Develop specific engineering, administrative, and personal controls for potential hazards for each work activity.</i>	
<u>Travel to and from site.</u>	<ol style="list-style-type: none"> 1. Vehicle breakdown 2. Improper operation of vehicle 3. Injury due to vehicular accident 	<ol style="list-style-type: none"> 1. • Confirm that vehicle is in good condition before operating. 2. • Only S&W employees with a valid drivers license shall operate S&W vehicles. 3. • Confirm that vehicle is in good condition before operating. <ul style="list-style-type: none"> • Check that mirrors, seat belts, and controls are adjusted correctly. • All vehicle occupants shall wear seat belts. • Do not use cell phone while driving. • Use defensive driving techniques. • Obey traffic rules and speed limits. 	
<u>General work on site.</u>	<ol style="list-style-type: none"> 1. Eye or head injury, hearing loss, cuts and abrasions 2. Injury from distraction or collision 3. Dehydration, fatigue, disorientation 4. Fatigue, overexertion 5. Injury due to unseen hazards in low light conditions 6. Exposure, hypothermia due to dangerous storms 7. Cuts and abrasions, electrocution due to lightning strike 	<ol style="list-style-type: none"> 1. • Wear appropriate clothing and required Personal Protective Equipment (see top of form for required PPE). 2. • Confirm that you can be seen by traffic, pedestrians, and/or onlookers. 3. • Stay hydrated and keep your body fueled (eat regularly). 4. • Take breaks, as necessary. 5. • Have appropriate lighting to perform the work. <ul style="list-style-type: none"> • Have a portable flashlight or other lighting device to travel beyond lighted areas. • Be aware of hidden hazards in unlighted areas. 6. • Check weather report prior to planning work for the day. Do not work if dangerous storms are predicted. 7. • When observing lightning, go to a safe place and use 30-30 rule. <ul style="list-style-type: none"> • In open areas, seek lowest spot and squat as low as possible. • Stay away from metal objects. • Stay away from tall, isolated objects, open fields, or areas where you may be the tallest object. • Seek shelter in a building or enclosed vehicle. Do not touch steering wheel, knobs, ignition, or radio. 	
<u>Walking around site</u>	<ol style="list-style-type: none"> 1. Sprains, strains, broken bones 2. Slips, trips, falls 	<ol style="list-style-type: none"> 1. • Wear appropriate foot protection. 2. • Use caution when working on uneven and wet ground surfaces. <ul style="list-style-type: none"> • Keep work area clear of debris, tools, and other materials that are not in use. 	

Tasks <i>Identify the work activities and steps</i>	Potential Hazards <i>Analyze each work activity for potential hazards</i>	Safe Job Practices <i>Develop specific engineering, administrative, and personal controls for potential hazards for each work activity.</i>
<u>Working at an airport</u>	1. Injury due to vehicle impact 2. Vehicular accidents, slips, trips and falls	1. • Follow approved traffic control plan (copy on site). • Confirm that traffic control is in place prior to walking/working on highway. • Wear appropriate PPE (see top of form) and high visibility clothing as required by traffic control plan and permit. • Do not move outside traffic control zone or stand in areas where you could be hit by vehicles. • Finish work promptly to minimize your potential exposure to traffic. 2. • Keep highway pavement clear of mud, debris, or other materials. • Make sure site is clean and free of obstructions before you leave.
	1. Injury (hearing loss, abrasions) due to general construction site hazards 2. Injury due to equipment, material, or other impact 3. Injury due to falls, excavation cave in	1. • Attend Contractor's safety orientation and daily safety tailgate meetings. • Wear appropriate PPE as required by Contractor (see top of form). • Do not work in an area that you consider unsafe, regardless of what the Contractor is doing. 2. • Ask Contractor/operators where you can work/observe safely without interfering with their operations. • Make sure the Contractor knows where you will be working on the site. • Get permission from operators and maintain eye contact when moving around working equipment. • Watch and listen for equipment operating near your work zone. • Watch for overhead hazards. Do not work under crane operations. • Keep clear of moving loads and equipment • Do not approach excavations without appropriate fall protection equipment in place.
<u>Drill rig setup</u>	1. Utility damage, explosion, electrocution due to contact with a utility 2. Injury due to shifting or overturning equipment 3. Injury due to vehicle impact 4. Injury due to equipment impact	1. • Make sure utilities have been located/marked prior to drilling. • Provide general boring location information to driller. Allow driller to select exact location, when possible. • Check overhead utilities in work area. Must be at least 10 feet from power lines. • Do not excavate closer than 10 feet to marked utility lines without hand digging to confirm utility location. • Check alignment of nearby manhole covers to confirm that they do not line up with exploration location. 2. • Check to make sure ground is stable in area of equipment. 3. • Check to make sure drill rig is clear of traffic or other adjacent activities. 4. • Stay clear of drill rig as it is setting up.
<u>Working around a drill rig</u>	1. Injury due to equipment impact 2. Hearing loss 3. Eye injury due to mud/water spray 4. Head injury due to falling or shifting loads 5. Injury due to uncontrolled drill rig operation	1. • Stay clear of drill rig operating area • Agree with driller as to a safe location for soil/core sample inspection. • Stay clear of drilling equipment when rods/casing is being added/removed. 2. • Wear appropriate PPE (see top of form), including ear protection. 3. • Wear appropriate PPE (see top of form), including eye protection. • Stay away from back of rig during drill rod breaks. 4. • Observe caution with overhead hazards 5. • Know where the "kill" switch is located on the drill rig.

Tasks <i>Identify the work activities and steps</i>	Potential Hazards <i>Analyze each work activity for potential hazards</i>	Safe Job Practices <i>Develop specific engineering, administrative, and personal controls for potential hazards for each work activity.</i>
<u>Lifting of samples or other heavy items</u>	1. Back injury due to lifting of heavy objects	1. • Stretch muscles before lifting. • Lift with the knees. • When lifting, maintain an upright position and avoid bending and twisting. • Keep the body as close to the load as possible. • Keep the travel distance for the lift to less than 10 feet. • Provide good handles or handholds for grasping loads. • Get assistance from others when possible • Wear back protection, if necessary
<u>Knife or blade</u>	1. Injury due to sharp object	1. Wear gloves while using knife

FIELD EQUIPMENT

Equipment to be Used <i>List equipment to be used in</i>	Inspection Requirements <i>List inspection requirements for the</i>	Training Requirements <i>List training requirements for the equipment</i>
<i>First aid kit</i>	<i>Check to make sure kit is complete prior to use at site. Replace used or outdated items.</i>	<i>Current First Aid certification is required for all S&W employees but use of first aid kit is permitted for anyone.</i>
<i>Fire extinguisher</i>	<i>Monthly inspection by S&W and yearly professional inspection. Check to make sure the inspection tag is not expired.</i>	<i>Fire extinguisher use training preferred, but use of fire extinguisher is permitted for anyone in an emergency.</i>
<i>Vehicles</i>	<i>Routine inspection by S&W so that vehicles meet the requirements for safe operation on roads. Seat belts shall be in good working order with no visible damage or alterations.</i>	<i>Valid driver's license</i>
<i>Personal Protective Equipment (PPE) - See top of form</i>	<i>PPE shall be in good working order with no visible damage or alterations.</i>	<i>Not applicable</i>
<i>PID</i>	<i>Daily inspection and calibration.</i>	<i>Operation by a trained S&W employee.</i>

MAP TO HOSPITAL

Cordova Community Medical Center; 602 Chase Ave, Cordova AK 99574



IN CASE OF EMERGENCY - CALL 911

(see next page for 911 call procedures)

911 CALL PROCEDURES

In an EMERGENCY, call 911 as soon as possible. Give the following information to the 911 dispatcher:

- WHERE the emergency is - use addresses, cross streets, or landmarks.
- TELEPHONE NUMBER you are calling from.
- WHAT HAPPENED - type of emergency.
- HOW MANY people need help?
- HOW MUCH was spilled (if applicable)?
- WHAT is being done?

YOU HANG UP LAST - Let the person you called hang up first. In the event of a MEDICAL EMERGENCY, do the following:

1. Call for help as soon as possible. Assess whether the scene is safety. If it is, help; if it is not, **DO NOT BECOME ANOTHER VICTIM.**
2. Administer CPR and emergency first aid if necessary.
3. If the victim can be moved, transport to the hospital while one person calls the hospital to notify them. If the injury or exposure is not life threatening, decontaminate the individual first. If decontamination is not feasible, wrap the individual in a blanket or sheet of plastic prior to transport; transport to the hospital via rescue squad vehicle.
4. Notify the PM and the HSO. If Shannon & Wilson staff are involved in the incident, the HSO will notify the Corporate Health and Safety Officer within 24 hours.
5. Complete appropriate form(s); see Appendix A of the Corporate Health and Safety Program.

ACKNOWLEDGEMENT AND SIGNATURE

I acknowledge that I have read the SSHSP for the Cordova Airport Hazardous Materials Assessment and that I understand the job hazards and safe job practices summarized on the JSA. I have met with the PM to discuss the project details and any questions I have related to my personal safety. I also acknowledge that I have read the Corporate Health and Safety Program documents for other Health and Safety information.

Printed Name: _____

Signature: _____

Date: _____

SAFETY DATA SHEETS

Methanol P&T**232-1L**

Version 4.0

Revision Date 03/05/2018

Print Date 04/09/2018

SECTION 1. IDENTIFICATION

Product name : Methanol P&T

Number : 00000011383

Product Use Description : Solvent

Manufacturer or supplier's details : Honeywell International Inc.
1953 South Harvey Street
Muskegon, MI 49442

For more information call : 1-800-368-0050
+1-231-726-3171

(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
: **Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887**
:
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : liquid, clear

Color : colourless

Odor : slight alcohol-like

Classification of the substance or mixture

Classification of the substance or mixture : **Flammable liquids, Category 2**
Specific target organ toxicity - single exposure, Category 1,
Eyes, Nervous system, Systemic toxicity

Methanol P&T**232-1L**

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Print Date 04/09/2018

GHS Label elements, including precautionary statements

Symbol(s)

:



Signal word

: **Danger**

Hazard statements

: **Highly flammable liquid and vapour.
Causes damage to organs.**

Precautionary statements

: **Prevention:****Keep away from heat/sparks/open flames/hot surfaces. No smoking.****Keep container tightly closed.****Ground/bond container and receiving equipment.****Use explosion-proof electrical/ ventilating/ lighting/ equipment.****Use only non-sparking tools.****Take precautionary measures against static discharge.****Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.****Wash skin thoroughly after handling.****Do not eat, drink or smoke when using this product.****Wear protective gloves/ protective clothing/ eye protection/ face protection.****Response:****IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.****IF exposed: Call a POISON CENTER or doctor/ physician.****In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.****Storage:****Store in a well-ventilated place. Keep cool.****Store locked up.****Disposal:****Dispose of contents/ container to an approved waste disposal plant.****Carcinogenicity**

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

Methanol P&T**232-1L**

Version 4.0

Revision Date 03/05/2018

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SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Methyl Alcohol

Formula : CH₄O

Chemical nature : Substance

Chemical name	CAS-No.	Concentration
Methanol	67-56-1	100.00 %

SECTION 4. FIRST AID MEASURES

Inhalation : Call a physician immediately. Remove to fresh air. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present.

Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician.

Ingestion : Call a physician immediately. Do NOT induce vomiting. Never give anything by mouth to an unconscious person.

Notes to physician

Indication of immediate medical attention and special treatment needed, if necessary : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURESSuitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical

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		Cool closed containers exposed to fire with water spray.
Unsuitable extinguishing media	:	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards during firefighting	:	Flammable. Vapours may form explosive mixtures with air. Vapours are heavier than air and may spread along floors. Vapors may travel to areas away from work site before igniting/flashing back to vapor source. In case of fire hazardous decomposition products may be produced such as: Carbon monoxide Carbon dioxide (CO ₂) Formaldehyde
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus and protective suit.
Further information	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Wear personal protective equipment. Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Do not breathe vapours or spray mist. Avoid contact with skin, eyes and clothing.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. Discharge into the environment must be avoided. Do not flush into surface water or sanitary sewer system. Do not allow run-off from fire fighting to enter drains or water courses.
Methods and materials for containment and cleaning up	:	Ventilate the area. No sparking tools should be used. Use explosion-proof equipment. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

Methanol P&T

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SECTION 7. HANDLING AND STORAGE

Handling

Precautions for safe handling : Wear personal protective equipment.
 Use only in well-ventilated areas.
 Keep container tightly closed.
 Do not smoke.
 Do not breathe vapours or spray mist.
 Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion : Keep away from fire, sparks and heated surfaces.
 Take precautionary measures against static discharges.
 Ensure all equipment is electrically grounded before beginning transfer operations.
 Use explosion-proof equipment.
 Keep product and empty container away from heat and sources of ignition.
 No sparking tools should be used.
 No smoking.

Storage

Conditions for safe storage, including any incompatibilities : Store in area designed for storage of flammable liquids.
 Protect from physical damage.
 Keep containers tightly closed in a dry, cool and well-ventilated place.
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.
 Keep away from heat and sources of ignition.
 Keep away from direct sunlight.
 Store away from incompatible substances.
 Container hazardous when empty.
 Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation.
 Prevent vapour buildup by providing adequate ventilation

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- during and after use.
- Eye protection : Do not wear contact lenses.
Wear as appropriate:
Safety glasses with side-shields
If splashes are likely to occur, wear:
Goggles or face shield, giving complete protection to eyes
- Hand protection : Solvent-resistant gloves
Gloves must be inspected prior to use.
Replace when worn.
- Skin and body protection : Wear as appropriate:
Solvent-resistant apron
Flame retardant antistatic protective clothing.
If splashes are likely to occur, wear:
Protective suit
- Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Use NIOSH approved respiratory protection.
- Hygiene measures : When using do not eat, drink or smoke.
Wash hands before breaks and immediately after handling the product.
Keep working clothes separately.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
This material has an established AIHA ERPG exposure limit.
The current list of ERPG exposure limits can be found at http://www.aiha.org/insideaiha/GuidelineDevelopment/ERPG/Documents/2011erpgweelhandbook_table-only.pdf.

Exposure Guidelines

Components	CAS-No.	Value	Control parameters	Update	Basis
Methanol	67-56-1	SKIN_DES : Skin designation:	Can be absorbed through the skin.	2008	ACGIH:US. ACGIH Threshold Limit Values

Methanol P&T

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Methanol	67-56-1	STEL : Short term exposure limit	(250 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values
Methanol	67-56-1	TWA : Time weighted average	(200 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values
Methanol	67-56-1	STEL : Short term exposure limit	325 mg/m3 (250 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
Methanol	67-56-1	SKIN_DE S : Skin designati on:	Can be absorbed through the skin.	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
Methanol	67-56-1	REL : Recomm ended exposure limit (REL):	260 mg/m3 (200 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
Methanol	67-56-1	PEL : Permissi ble exposure limit	260 mg/m3 (200 ppm)	02 2006	OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Methanol	67-56-1	SKIN_FI NAL : Skin designati on (Final Rule Limit Limit applies):	Can be absorbed through the skin.	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)

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Methanol	67-56-1	STEL : Short term exposure limit	325 mg/m ³ (250 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)
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Methanol	67-56-1	TWA : Time weighted average	260 mg/m ³ (200 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)
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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: liquid, clear
Color	: colourless
Odor	: slight alcohol-like
Odor threshold	: Note: no data available
pH	: Note: Not applicable
Melting point/range	: Note: Not applicable
Boiling point/boiling range	: 64.7 °C
Flash point	: 52 °F (11 °C) Method: closed cup
Evaporation rate	: ca. 5 Method: Compared to Butyl acetate.
Lower explosion limit	: 6 %(V)
Upper explosion limit	: 36 %(V)
Vapor pressure	: 129.32 hPa

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	at 20 °C(68 °F)
Vapor density	: 1.11 Note: (Air = 1.0)
Density	: 0.792 g/cm ³ at 20 °C
Water solubility	: Note: completely soluble
Partition coefficient: n-octanol/water	: Note: no data available
Ignition temperature	: 464 °C
Decomposition temperature	: Note: No decomposition if used as directed.
Viscosity, dynamic	: Note: no data available
Viscosity, kinematic	: Note: no data available
Molecular weight	: 32.04 g/mol

SECTION 10. STABILITY AND REACTIVITY

Chemical stability	: Stable under recommended storage conditions.
Possibility of hazardous reactions	: Hazardous polymerization does not occur.
Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight.
Incompatible materials	: Strong oxidizing agents Aluminium Magnesium May attack many plastics, rubbers and coatings.
Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Carbon monoxide

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Carbon dioxide (CO2)
Formaldehyde**SECTION 11. TOXICOLOGICAL INFORMATION**

Acute oral toxicity	: LD50: 5,628 mg/kg Species: Rat
Acute inhalation toxicity	: LC50: 64000 ppm Exposure time: 4 h Species: Rat
Acute dermal toxicity	: LD50: 15,800 mg/kg Species: Rabbit
Skin irritation	: Species: Rabbit Classification: irritating Exposure time: 24 h
Eye irritation	: Species: rabbit eye Classification: irritating
Repeated dose toxicity	: Species: Rat Application Route: Inhalation Test substance: Methanol Note: Developmental Toxicity NOAEL (maternal toxicity) 10,000 ppm NOAEL (developmental toxicity) 5,000 ppm Skeletal and visceral malformations.
Genotoxicity in vitro	: Note: In vitro tests did not show mutagenic effects
Genotoxicity in vivo	: Note: In vivo tests did not show mutagenic effects

SECTION 12. ECOLOGICAL INFORMATION

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Ecotoxicity effects

Toxicity to fish : LC50: 29,400 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates : LC50: 10,000 mg/l
Exposure time: 24 h
Species: Daphnia (water flea)

Toxicity to bacteria : EC50: 43,000 mg/l
Exposure time: 5 min
Species: Photobacterium phosphoreum

: EC50: 40,000 mg/l
Exposure time: 15 min
Species: Photobacterium phosphoreum

: EC50: 39,000 mg/l
Exposure time: 25 min
Species: Photobacterium phosphoreum

Further information on ecology

Additional ecological information : Accumulation in aquatic organisms is unlikely.
The product is readily degradable in the environment.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT UN/ID No. : UN 1230
Proper shipping name : METHANOL
Class 3
Packing group II
Hazard Labels 3

Methanol P&T

232-1L

Version 4.0

Revision Date 03/05/2018

Print Date 04/09/2018

IATA	UN/ID No.	: UN 1230
	Description of the goods	: METHANOL
	Class	: 3
	Packaging group	: II
	Hazard Labels	: 3 (6.1)
	Packing instruction (cargo aircraft)	: 364
	Packing instruction (passenger aircraft)	: 352
	Packing instruction (passenger aircraft)	: Y341
IMDG	UN/ID No.	: UN 1230
	Description of the goods	: METHANOL
	Class	: 3
	Packaging group	: II
	Hazard Labels	: 3 (6.1)
	EmS Number	: F-E, S-D
	Marine pollutant	: no
IMDG Code segregation group according chapter 3.1.4.4		: NONE,

SECTION 15. REGULATORY INFORMATION

Inventories

US. Toxic Substances Control Act	: On TSCA Inventory
Australia. Industrial Chemical (Notification and Assessment) Act	: On the inventory, or in compliance with the inventory
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)	: All components of this product are on the Canadian DSL
Japan. Kashin-Hou Law List	: On the inventory, or in compliance with the inventory
Korea. Existing Chemicals Inventory (KECI)	: On the inventory, or in compliance with the inventory
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	: On the inventory, or in compliance with the inventory

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China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

US. EPA CERCLA Hazardous Substances (40 CFR 302) : The following component(s) of this product is/are subject to release reporting under 40 CFR 302 when release exceeds the Reportable Quantity (RQ):

Reportable quantity: 5000 lbs
 : Methanol 67-56-1

SARA 302 Components : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components : The following components are subject to reporting levels established by SARA Title III, Section 313:
 : Methanol 67-56-1

SARA 311/312 Hazards : Fire Hazard
 Acute Health Hazard
 Chronic Health Hazard

CERCLA Reportable Quantity : 5000 lbs

California Prop. 65 : WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
 Methanol 67-56-1

Massachusetts RTK : Methanol 67-56-1

New Jersey RTK : Methanol 67-56-1

Pennsylvania RTK : Methanol 67-56-1

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SECTION 16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 2*	1
Flammability	: 3	3
Physical Hazard	: 0	
Instability	:	0

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

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 a 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. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Previous Issue Date: 03/26/2015

Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group

Lead

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 12/15/2014 Revision date: 12/15/2014 Version: 1.1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance
CAS No : 7439-92-1
Formula : Pb
Synonyms : C.I. 77575, in massive state / elemental lead, in massive state / glover, in massive state
BIG no : 10073

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

Use of the substance/mixture : Solder
Battery: component
Construction
Electrodes

1.3. Details of the supplier of the safety data sheet

GSC International, Inc.
1747 N. Deffer Drive
Nixa,
MO 65714
United States of America

Tel: 417-374-7431
Fax: 417-374-7442
Email: info@gsccinternationalinc.com

1.4. Emergency telephone number

Country	Organization/Company	Address	Emergency number
MEXICO	Servicio de Informacion Toxicologica Sintox	Tintoreto #32 Edif. a Desp. Col. Nochebuena Mixcoac México, D.F.	1 800 009 2800 +52 55 5611 2634 /+52 55 5598 9095
UNITED STATES OF AMERICA	American Association of Poison Control Centers		1-800-222-1222

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Acute Tox. 4 (Oral) H302
Acute Tox. 4 (Inhalation) H332
Carc. 1B H350
Repr. 1A H360
STOT RE 2 H373
Aquatic Acute 1 H400
Aquatic Chronic 1 H410

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS07

GHS08

GHS09

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H302+H332 - Harmful if swallowed or if inhaled
H350 - May cause cancer
H360 - May damage fertility or the unborn child
H373 - May cause damage to organs through prolonged or repeated exposure

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H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US) :

- P201 - Obtain special instructions before use
- P202 - Do not handle until all safety precautions have been read and understood
- P260 - Do not breathe dust, fume
- P264 - Wash hands thoroughly after handling
- P270 - Do not eat, drink or smoke when using this product
- P273 - Avoid release to the environment
- P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
- P308+P313 - If exposed or concerned: Get medical advice/attention
- P314 - Get medical advice/attention if you feel unwell
- P501 - Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Name	Product identifier	%	Classification (GHS-US)
Lead (Main constituent)	(CAS No) 7439-92-1	> 99,9	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Carc. 1B, H350 Repr. 1A, H360 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H-phrases: see section 16

3.2. Mixture

Not applicable

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice. IF exposed or concerned: Get medical advice/attention. Call a poison center/doctor/physician if you feel unwell.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Not applicable. Call a poison center/doctor/physician if you feel unwell.

First-aid measures after skin contact : Not applicable. Wash skin with plenty of water.

First-aid measures after eye contact : Not applicable. Rinse eyes with water as a precaution.

First-aid measures after ingestion : Not applicable. Rinse mouth. Call a poison center/doctor/physician if you feel unwell.

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

Symptoms/injuries after inhalation : No effects known.

Symptoms/injuries after skin contact : No effects known.

Symptoms/injuries after eye contact : No effects known.

Symptoms/injuries after ingestion : No effects known.

Chronic symptoms : No effects known.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Adapt extinguishing media to the environment.

Unsuitable extinguishing media : No unsuitable extinguishing media known.

5.2. Special hazards arising from the substance or mixture

Fire hazard : DIRECT FIRE HAZARD. Non combustible.

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- Explosion hazard : DIRECT EXPLOSION HAZARD. No data available on direct explosion hazard. INDIRECT EXPLOSION HAZARD. No data available on indirect explosion hazard.
- Reactivity : On burning: formation of metallic fumes. Oxidizes on exposure to air.

5.3. Advice for firefighters

- Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to heat: have neighborhood close doors and windows.
- Firefighting instructions : Dilute toxic gases with water spray. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.
- Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus. Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment : Gloves. Protective clothing. See "Material-Handling" to select protective clothing.
- Emergency procedures : Mark the danger area. No naked flames.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment. Prevent soil and water pollution. Prevent spreading in sewers. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- For containment : Not applicable. Collect spillage.
- Methods for cleaning up : Recover mechanically the product. Pick-up the material. Take collected spill to manufacturer/competent authority. Notify authorities if product enters sewers or public waters.
- Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Meet the legal requirements. Do not discharge the waste into the drain. Handle unclean empty containers as full ones. Observe strict hygiene. Measure the concentration in the atmosphere. Carry out operations in the open/under local exhaust/ventilation or with respiratory protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, fume. Use only outdoors or in a well-ventilated area. Take all necessary technical measures to avoid or minimize the release of the product on the workplace. Limit quantities of product at the minimum necessary for handling and limit the number of exposed workers. Provide local exhaust or general room ventilation. Wear personal protective equipment. Floors, walls and other surfaces in the hazard area must be cleaned regularly.
- Hygiene measures : Separate working clothes from town clothes. Launder separately. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Does not require any specific or particular technical measures. Comply with applicable regulations.
- Storage conditions : Store locked up. Store in a well-ventilated place. Keep cool.
- Incompatible materials : Strong acids, strong bases and oxidation agents.
- Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources.
- Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents. Strong acids. Strong bases.
- Storage area : Meet the legal requirements.
- Special rules on packaging : SPECIAL REQUIREMENTS: closing. correctly labeled. meet the legal requirements. Secure fragile packaging in solid containers.

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7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Lead (7439-92-1)		
ACGIH	ACGIH TWA (mg/m ³)	0,05 mg/m ³
ACGIH	Remark (ACGIH)	CNS & PNS impair
OSHA	Not applicable	

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Ensure good ventilation of the work station.

Personal protective equipment : Protective goggles. Gloves.



Materials for protective clothing : GIVE EXCELLENT RESISTANCE: No data available. GIVE GOOD RESISTANCE: butyl rubber. PVC. GIVE LESS RESISTANCE: No data available. GIVE POOR RESISTANCE: No data available.

Hand protection : protective gloves.

Eye protection : Safety glasses.

Skin and body protection : Not required for normal conditions of use.

Respiratory protection : Wear respiratory protection.

Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Metal.
Molecular mass	: 207,20 g/mol
Color	: White to blue-grey
Odor	: Odorless
Odor threshold	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: 327 °C
Freezing point	: No data available
Boiling point	: 1740 °C
Flash point	: Not applicable
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: < 0,1 hPa
Relative vapor density at 20 °C	: No data available
Relative density	: 11,3
Specific gravity / density	: 11340 kg/m ³
Solubility	: insoluble in water. Substance sinks in water. Soluble in nitric acid. Insoluble in organic solvents. Water: < 0,1 g/100ml
Log Pow	: 0,73 (Estimated value)
Log Kow	: No data available

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Viscosity, kinematic	: Not applicable
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

9.2. Other information

VOC content	: Not applicable (inorganic)
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SECTION 10: Stability and reactivity

10.1. Reactivity

On burning: formation of metallic fumes. Oxidizes on exposure to air.

10.2. Chemical stability

Unstable on exposure to air.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

No additional information available

10.5. Incompatible materials

Acids. Bases.

10.6. Hazardous decomposition products

Thermal decomposition generates : fume.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation: Harmful if inhaled.

Lead (Pb) 7439-92-1	
LD50 oral rat	> 2000 mg/kg body weight (Rat; Weight of evidence)
LD50 dermal rat	> 2000 mg/kg body weight (Rat; Experimental value; OECD 402: Acute Dermal Toxicity)
ATE US (oral)	500,000 mg/kg body weight
ATE US (gases)	4500,000 ppmV/4h
ATE US (vapors)	11,000 mg/l/4h
ATE US (dust, mist)	1,500 mg/l/4h
Additional information	Lead massive metal is not considered to be acutely toxic. It is not easily inhaled or ingested, and if it is accidentally ingested normally passes through the gastrointestinal system without significant absorption into the body. Lead is not easily absorbed through the skin.

Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met)
Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met)
Respiratory or skin sensitization	: Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	: May cause cancer.

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Lead (7439-92-1)	
Additional information	There is some evidence that inorganic lead compounds may have a carcinogenic effect, and they have been classified by IARC as probably carcinogenic to humans. However, it is considered that this classification does not apply to lead in articles, given the very low bioavailability of metallic lead. Carcinogenicity studies of lead metal powder have been negative. Epidemiology studies of workers exposed to inorganic lead compounds have found a limited association with stomach cancer. IARC has concluded that lead metal is possibly carcinogenic to humans (Group aB).
IARC group	2B - Possibly carcinogenic to humans
National Toxicology Program (NTP) Status	3 - Reasonably anticipated to be Human Carcinogen

Reproductive toxicity	: May damage fertility or the unborn child.
Specific target organ toxicity (single exposure)	: Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity (repeated exposure)	: May cause damage to organs through prolonged or repeated exposure.

Lead (7439-92-1)	
Additional information	Lead is a cumulative poison and may be absorbed into the body through ingestion or inhalation. Although inhalation and ingestion of lead in massive form are unlikely, poor hygiene practises may result in hand to mouth transfer which maybe significant over a prolonged period of time. Inorganic lead compounds have been documented in observational human studies to produce toxicity in multiple organ systems and body function including the haemotopoetic (blood) system, kidney function, reproductive function and the central nervous system.

Aspiration hazard	: Not classified (Based on available data, the classification criteria are not met)
Symptoms/injuries after inhalation	: No effects known.
Symptoms/injuries after skin contact	: No effects known.
Symptoms/injuries after eye contact	: No effects known.
Symptoms/injuries after ingestion	: No effects known.
Chronic symptoms	: No effects known.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Dangerous for the environment. Very toxic to aquatic life with long lasting effects.
Ecology - air	: Not dangerous for the ozone layer (Regulation (EC) No 1005/2009). Not included in the list of fluorinated greenhouse gases (Regulation (EC) No 842/2006). TA-Luft Klasse 5.2.2/II.
Ecology - water	: No water pollutant (surface water). Maximum concentration in drinking water: 0.010 mg/l (lead) (Directive 98/83/EC). Highly toxic to aquatic organisms.

Lead (7439-92-1)	
LC50 fish 1	2,8 (0,44 - 542) mg/l (96h) Coughlan, D.J., S.P. Gloss, and J. Kubota 1986. Acute and Sub-Chronic Toxicity of Lead to the Early Life Stages of Small mouth Bass (<i>Micropterus dolomieu</i>). <i>Water Air Soil Pollut.</i> 28(3/4):265-275
EC50 Daphnia 1	4,46 (0,53 - 5,1) mg/l (48h) Govindarajan, S., C.P. Valsaraj, R. Mohan, V. Hariprasad, and R. Ramasubramanian 1993. Toxicity of Heavy Metals in Aquaculture Organisms: <i>Penaeus indicus</i> , <i>Perna viridis</i> , <i>Artemia salina</i> and <i>Skeletonema costatum</i> . <i>Pollut.Res.</i> 12(3):187-189

12.2. Persistence and degradability

Lead (7439-92-1)	
Persistence and degradability	Biodegradability: Not applicable. No (test)data available on mobility of the substance.
ThOD	Not applicable (inorganic)

12.3. Bioaccumulative potential

Lead (7439-92-1)	
Log Pow	0,73 (Estimated value)
Bioaccumulative potential	Low bioaccumulation potential (Log Kow < 4).

12.4. Mobility in soil

No additional information available

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12.5. Other adverse effects

Effect on ozone layer :

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose in a safe manner in accordance with local/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. Reuse or recycle following decontamination. Remove to an authorized dump (Class I). Do not discharge into surface water (2000/60/EC, Council decision 2455/2001/EC, O.J. L331 of 15/12/2001).

Additional information : LWCA (the Netherlands): KGA category 05. Hazardous waste according to Directive 2008/98/EC.

SECTION 14: Transport information

In accordance with DOT

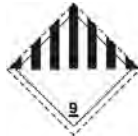
Transport document description : UN3077 Environmentally hazardous substances, solid, n.o.s. Lead(7439-92-1), 9, III

UN-No.(DOT) : UN3077

Proper Shipping Name (DOT) : Environmentally hazardous substances, solid, n.o.s.
Lead(7439-92-1)

Department of Transportation (DOT) Hazard Classes : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140

Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



DOT Symbols : G - Identifies PSN requiring a technical name

Packing group (DOT) : III - Minor Danger

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DOT Special Provisions (49 CFR 172.102)	: 8 - A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substances, liquid or solid, n.o.s.", as appropriate. In addition, for solid materials, special provision B54 applies. 146 - This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination. 335 - Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as "Environmentally hazardous substances, solid, n.o.s.," UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leak-proof when used as bulk packaging. A112 - Notwithstanding the quantity limits shown in Column (9A) and (9B) for this entry, the following IBCs are authorized for transportation aboard passenger and cargo-only aircraft. Each IBC may not exceed a maximum net quantity of 1,000 kg: a. Metal: 11A, 11B, 11N, 21A, 21B and 21N b. Rigid plastics: 11H1, 11H2, 21H1 and 21H2 c. Composite with plastic inner receptacle: 11HZ1, 11HZ2, 21HZ1 and 21HZ2 d. Fiberboard: 11G e. Wooden: 11C, 11D and 11F (with inner liners) f. Flexible: 13H2, 13H3, 13H4, 13H5, 13L2, 13L3, 13L4, 13M1 and 13M2 (flexible IBCs must be sift-proof and water resistant or must be fitted with a sift-proof and water resistant liner). B54 - Open-top, sift-proof rail cars are also authorized. IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2). IP3 - Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner. N20 - A 5M1 multi-wall paper bag is authorized if transported in a closed transport vehicle. T1 - 1.5 178.274(d)(2) Normal..... 178.275(d)(2) TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 155
DOT Packaging Non Bulk (49 CFR 173.xxx)	: 213
DOT Packaging Bulk (49 CFR 173.xxx)	: 240
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: No limit
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: No limit
DOT Vessel Stowage Location	: A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Additional information

Other information : No supplementary information available.

ADR

No additional information available

Transport by sea

UN-No. (IMDG)	: 3077
Proper Shipping Name (IMDG)	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Class (IMDG)	: 9 - Miscellaneous dangerous compounds
Packing group (IMDG)	: III - substances presenting low danger

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Air transport

UN-No.(IATA) : 3077
Proper Shipping Name (IATA) : Environmentally hazardous substance, solid, n.o.s.
Class (IATA) : 9 - Miscellaneous Dangerous Goods
Packing group (IATA) : III - Minor Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

Lead (7439-92-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on United States SARA Section 313
Not listed on the United States SARA Section 313

RQ (Reportable quantity, section 304 of EPA's List of Lists)	10 lb
--	-------

15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Repr. 1A H360Df
Acute Tox. 4 (Inhalation) H332
Acute Tox. 4 (Oral) H302
STOT RE 2 H373
Aquatic Acute 1 H400
Aquatic Chronic 1 H410
Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Repr.Cat.1; R61
Repr.Cat.3; R62
Xn; R20/22
R33
N; R50/53

Full text of R-phrases: see section 16

15.2.2. National regulations

Lead (7439-92-1)

Listed on IARC (International Agency for Research on Cancer)
Listed as carcinogen on NTP (National Toxicology Program)

15.3. US State regulations

No additional information available

SECTION 16: Other information

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Full text of H-phrases:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhalation) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Carc. 1B	Carcinogenicity Category 1B
Repr. 1A	Reproductive toxicity Category 1A
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H302	Harmful if swallowed
H332	Harmful if inhaled
H350	May cause cancer
H360	May damage fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

NFPA health hazard

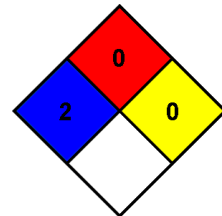
: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard

: 0 - Materials that will not burn.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : * Chronic Hazard - Chronic (long-term) health effects may result from repeated overexposure

Flammability : 0 Minimal Hazard

Physical : 0 Minimal Hazard

Personal Protection : B

SDS US (GHS HazCom 2012)

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



Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950
US GHS

Synonyms: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

*** Section 1 - Product and Company Identification ***

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

*** Section 2 - Hazards Identification ***

GHS Classification:

Flammable Liquid - Category 2
Skin Corrosion/Irritation - Category 2
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1B
Toxic to Reproduction - Category 1A
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statements

Highly flammable liquid and vapour.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

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Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapours/spray.
Use only outdoors or in well-ventilated area.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

Storage

Store in a well-ventilated place.
Keep cool. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9

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110-54-3	Hexane	0.5-4
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A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or gaseous extinguishing agent.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

Unsuitable Extinguishing Media

None

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Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

USE ONLY AS A MOTOR FUEL.
DO NOT SIPHON BY MOUTH

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

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Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA
500 ppm STEL

Toluene (108-88-3)

ACGIH: 20 ppm TWA
OSHA: 200 ppm TWA; 375 mg/m³ TWA
150 ppm STEL; 560 mg/m³ STEL
NIOSH: 100 ppm TWA; 375 mg/m³ TWA
150 ppm STEL; 560 mg/m³ STEL

Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
OSHA: 800 ppm TWA; 1900 mg/m³ TWA
NIOSH: 800 ppm TWA; 1900 mg/m³ TWA

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA
150 ppm STEL
OSHA: 100 ppm TWA; 435 mg/m³ TWA
150 ppm STEL; 655 mg/m³ STEL

Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m³ TWA

Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL
OSHA: 1000 ppm TWA; 1900 mg/m³ TWA
NIOSH: 1000 ppm TWA; 1900 mg/m³ TWA

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Ethylbenzene (100-41-4)

ACGIH: 20 ppm TWA
OSHA: 100 ppm TWA; 435 mg/m³ TWA
125 ppm STEL; 545 mg/m³ STEL
NIOSH: 100 ppm TWA; 435 mg/m³ TWA
125 ppm STEL; 545 mg/m³ STEL

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: 0.1 ppm TWA
1 ppm STEL

Hexane (110-54-3)

ACGIH: 50 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 500 ppm TWA; 1800 mg/m³ TWA
NIOSH: 50 ppm TWA; 180 mg/m³ TWA

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

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*** Section 9 - Physical & Chemical Properties ***

Appearance:	Translucent, straw-colored or light yellow	Odor:	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
Physical State:	Liquid	pH:	ND
Vapor Pressure:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	Vapor Density:	AP 3-4
Boiling Point:	85-437 °F (39-200 °C)	Melting Point:	ND
Solubility (H2O):	Negligible to Slight	Specific Gravity:	0.70-0.78
Evaporation Rate:	10-11	VOC:	ND
Percent Volatile:	100%	Octanol/H2O Coeff.:	ND
Flash Point:	-45 °F (-43 °C)	Flash Point Method:	PMCC
Upper Flammability Limit (UFL):	7.6%	Lower Flammability Limit (LFL):	1.4%
Burning Rate:	ND	Auto Ignition:	>530°F (>280°C)

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

*** Section 11 - Toxicological Information ***

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

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Xylenes (o-, m-, p- isomers) (1330-20-7)

Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)

Inhalation LC50 Rat 18 g/m³ 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

Ethyl alcohol (64-17-5)

Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

Ethylbenzene (100-41-4)

Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

Benzene (71-43-2)

Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Hexane (110-54-3)

Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Moderate irritant. Contact with liquid or vapor may cause irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This product may cause genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

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IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

B: Component Carcinogenicity

Gasoline, motor fuel (86290-81-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Ethyl alcohol (64-17-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen

OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA

NIOSH: potential occupational carcinogen

NTP: Known Human Carcinogen (Select Carcinogen)

IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is suspected of damaging fertility or the unborn child.

Specified Target Organ General Toxicity: Single Exposure

This product may cause drowsiness or dizziness.

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Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Gasoline, motor fuel (86290-81-5)

Test & Species	Conditions
96 Hr LC50 Alburnus alburnus	119 mg/L [static]
96 Hr LC50 Cyprinodon variegatus	82 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	56 mg/L
24 Hr EC50 Daphnia magna	170 mg/L

Toluene (108-88-3)

Test & Species	Conditions	
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L [semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

Xylenes (o-, m-, p- isomers) (1330-20-7)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through]

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96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi- static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

Benzene, 1,2,4-trimethyl- (95-63-6)

Test & Species

Conditions

96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

Ethyl alcohol (64-17-5)

Test & Species

Conditions

96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

Ethylbenzene (100-41-4)

Test & Species

Conditions

96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi- static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow- through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

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96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

Benzene (71-43-2)

Test & Species

Conditions

96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

Hexane (110-54-3)

Test & Species

Conditions

96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

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*** Section 14 - Transportation Information ***

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

DOT Information

Shipping Name: Gasoline

UN #: 1203 Hazard Class: 3 Packing Group: II

Placard:



*** Section 15 - Regulatory Information ***

Regulatory Information

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Toluene (108-88-3)

SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylenes (o-, m-, p- isomers) (1330-20-7)

SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Benzene, 1,2,4-trimethyl- (95-63-6)

SARA 313: 1.0 % de minimis concentration

Ethylbenzene (100-41-4)

SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Benzene (71-43-2)

SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ; 2270 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health

X

Chronic Health

X

Fire

X

Sudden Release of Pressure

--

Reactive

--

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

Additional Regulatory Information

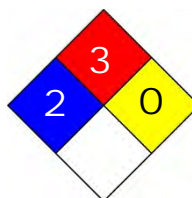
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

*** Section 16 - Other Information ***

NFPA® Hazard Rating

Health	2
Fire	3
Reactivity	0



HMIS® Hazard Rating

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal

*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet



Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909
US GHS

Synonyms: Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

*** Section 1 - Product and Company Identification ***

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

*** Section 2 - Hazards Identification ***

GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation – Category 2
Germ Cell Mutagenicity – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapours/spray.

Response

In case of fire: Use water spray, fog or foam to extinguish.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/attention.

Storage

Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m³ TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m³ TWA
NIOSH: 10 ppm TWA; 50 mg/m³ TWA
15 ppm STEL; 75 mg/m³ STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Clear, straw-yellow.	Odor:	Mild, petroleum distillate odor
Physical State:	Liquid	pH:	ND
Vapor Pressure:	0.009 psia @ 70 °F (21 °C)	Vapor Density:	>1.0
Boiling Point:	320 to 690 °F (160 to 366 °C)	Melting Point:	ND
Solubility (H₂O):	Negligible	Specific Gravity:	0.83-0.876 @ 60°F (16°C)
Evaporation Rate:	Slow; varies with conditions	VOC:	ND
Percent Volatile:	100%	Octanol/H₂O Coeff.:	ND
Flash Point:	>125 °F (>52 °C) minimum	Flash Point Method:	PMCC
Upper Flammability Limit (UFL):	7.5	Lower Flammability Limit (LFL):	0.6
Burning Rate:	ND	Auto Ignition:	494°F (257°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m³ 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

B: Component Carcinogenicity

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Fuels, diesel, no. 2 (68476-34-6)

Test & Species

96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]
--------------------------------	------------------------

Conditions

Naphthalene (91-20-3)

Test & Species

96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]

Conditions

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

*** Section 13 - Disposal Considerations ***

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

*** Section 14 - Transportation Information ***

DOT Information

Shipping Name: Diesel Fuel

NA #: 1993 Hazard Class: 3 Packing Group: III

Placard:



*** Section 15 - Regulatory Information ***

Regulatory Information

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

<u>Acute Health</u>	<u>Chronic Health</u>	<u>Fire</u>	<u>Sudden Release of Pressure</u>	<u>Reactive</u>
X	X	X	--	--

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

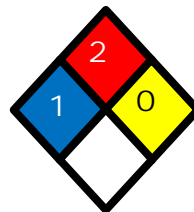
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

*** Section 16 - Other Information ***

NFPA® Hazard Rating

Health	1
Fire	2
Reactivity	0



HMIS® Hazard Rating

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal

*Chronic

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

- Product Name** • **Asbestos, Chrysotile**
- Synonyms** • Chrysotile Asbestos; Serpentine chrysotile; White asbestos
- Product Code** • 02107A-AB; 02701-AB; 02740A-AB; 02740-AB

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

- Relevant identified use(s)** • Laboratory standard in the microscopy laboratory

1.3 Details of the supplier of the safety data sheet

- Manufacturer** • SPI Supplies Division Structure Probe, Inc.
206 Garfield Ave.
West Chester, PA 19380
United States
<http://www.2spi.com>
SDS@2spi.com
- Telephone (General)** • 1-(610)-436-5400

1.4 Emergency telephone number

- Manufacturer** • 1-(800)-424-9300 - Chemtrec
- Manufacturer** • 1-(703)-741-5970 - Worldwide

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 2015/830]

2.1 Classification of the substance or mixture

- CLP** • Carcinogenicity 1A - H350
Specific Target Organ Toxicity Repeated Exposure 1 - H372

2.2 Label Elements

CLP

DANGER



- Hazard statements** • H350 - May cause cancer.
H372 - Causes damage to organs through prolonged or repeated exposure.

Precautionary statements

- Prevention** • P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe dust.
P264 - Wash thoroughly after handling.

P270 - Do not eat, drink or smoke when using this product.

P281 - Use personal protective equipment as required.

Response • P308+P313 - IF exposed or concerned: Get medical advice/attention.
P314 - Get medical advice/attention if you feel unwell.

Storage/Disposal • P405 - Store locked up.
P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

2.3 Other Hazards

CLP • According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012 • Carcinogenicity 1A
Specific Target Organ Toxicity Repeated Exposure 1

2.2 Label elements

OSHA HCS 2012

DANGER



Hazard statements • May cause cancer.
Causes damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention • Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.

Response • IF exposed or concerned: Get medical advice/attention.
Get medical advice/attention if you feel unwell.

Storage/Disposal • Store locked up.
Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

2.3 Other hazards

OSHA HCS 2012 • Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition					
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive	Comments
Asbestos, chrysotile	CAS:12001-29-5 EU Index:650-013-00-6	> 99.99%	NDA	EU CLP: Annex VI, Table 3.1: Carc. 1A, H350; STOT RE 1, H372 ** OSHA HCS 2012: Carc. 1A; STOT RE 1 (Lungs)	NDA

3.2 Mixtures

- Material does not meet the criteria of a mixture.

Section 4 - First Aid Measures

4.1 Description of first aid measures

- | | |
|-------------------|---|
| Inhalation | • Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. If signs/symptoms continue, get medical attention. |
| Skin | • Wash skin with soap and water. Flush with copious amounts of water for 15 minutes. |
| Eye | • In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. Get medical attention immediately. |
| Ingestion | • Obtain medical attention immediately if ingested. |

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

- | | |
|---------------------------|--|
| Notes to Physician | • All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. |
|---------------------------|--|

Section 5 - Firefighting Measures

5.1 Extinguishing media

- | | |
|-------------------------------------|------------------------------|
| Suitable Extinguishing Media | • Water, Foam, Dry Chemical. |
|-------------------------------------|------------------------------|

- | | |
|---------------------------------------|---------------------|
| Unsuitable Extinguishing Media | • No data available |
|---------------------------------------|---------------------|

5.2 Special hazards arising from the substance or mixture

- | | |
|---|---|
| Unusual Fire and Explosion Hazards | • Negligible fire and explosion hazard. Toxic gases and asbestos particulate may be released in a fire. |
| Hazardous Combustion Products | • No data available |

5.3 Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

- | | |
|-----------------------------|---|
| Personal Precautions | • Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. |
| Emergency Procedures | • As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. |

6.2 Environmental precautions

- Avoid run off to waterways and sewers.

6.3 Methods and material for containment and cleaning up

- | | |
|-----------------------------|--------------------------|
| Containment/Clean-up | • Avoid generating dust. |
|-----------------------------|--------------------------|

Measures

Use HEPA vacuum wet methods when feasible.
Carefully shovel or sweep up spilled material and place in suitable container.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage**7.1 Precautions for safe handling****Handling**

- Use only with adequate ventilation. Minimize dust generation and accumulation. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe dust. Avoid contact with skin, eyes, and clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities**Storage**

- Store in well-sealed container in cool, dry area in accordance with all current regulations and standards.

7.3 Specific end use(s)

- This item is not being offered for clinical or diagnostic applications, agricultural uses or for human or animal consumption. Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection**8.1 Control parameters**

Exposure Limits/Guidelines		
	Result	OSHA
Asbestos, chrysotile (12001-29-5)	TWAs	0.1 fiber/cm ³ TWA

8.2 Exposure controls**Engineering Measures/Controls**

- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is not leakage from the equipment).

Personal Protective Equipment**Respiratory**

- For limited exposure use an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety goggles.

Skin/Body

- Wear appropriate gloves. Wear long sleeves and/or protective coveralls.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

Additional Protection Measures

- An eyewash station and emergency shower must be available to the work station.

Key to abbreviations

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	White, gray, greenish, or yellowish, odorless, fibrous solid.
Color	White, gray, greenish, or yellowish.	Odor	Odorless
Odor Threshold	Data lacking		
General Properties			
Boiling Point	Data lacking	Melting Point/Freezing Point	> 500 °C(> 932 °F)
Decomposition Temperature	1000 °C(1832 °F)	pH	Data lacking
Specific Gravity/Relative Density	2.2-2.6 g/cc	Water Solubility	Data lacking
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Data lacking		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Hazardous polymerization will not occur.

10.4 Conditions to avoid

- Avoid generating dust.

10.5 Incompatible materials

- Strong oxidizers, strong acids, and bases.

10.6 Hazardous decomposition products

- None known.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Asbestos, chrysotile (> 99.99%)	12001-29-5	<p>Multi-dose Toxicity: Inhalation-Hamster TCLo • 30 mg/m³ 6 Hour(s) 78 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:Fibrosis (interstitial)</i>; <i>Lungs, Thorax, or Respiration:Changes in lung weight</i>; Inhalation-Rat TCLo • 8210 µg/m³ 6 Hour(s) 20 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:Fibrosis (interstitial)</i>;</p> <p>Tumorigen / Carcinogen: Ingestion/Oral-Rat TDLo • 7100 mg/kg 39 Week(s)-Continuous; <i>Tumorigenic:Carcinogenic by RTECS criteria</i>; <i>Liver:Tumors</i>; <i>Kidney, Ureter, and Bladder:Kidney tumors</i>; Inhalation-Man TCLo • 400 mppcf 1 Year(s)-Continuous; <i>Tumorigenic:Carcinogenic by RTECS criteria</i>; <i>Lungs, Thorax, or Respiration:Fibrosis, focal (pneumoconiosis)</i>; <i>Lungs, Thorax, or Respiration:Tumors</i>; Inhalation-Rat TCLo • 11 mg/m³ 26 Week(s)-Intermittent; <i>Tumorigenic:Carcinogenic by RTECS criteria</i>; <i>Lungs, Thorax, or Respiration:Tumors</i></p>

GHS Properties	Classification
Acute toxicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Skin corrosion/Irritation	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Serious eye damage/Irritation	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Skin sensitization	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Respiratory sensitization	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Aspiration Hazard	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Carcinogenicity	EU/CLP • Carcinogenicity 1A; May cause cancer OSHA HCS 2012 • Carcinogenicity 1A
Germ Cell Mutagenicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Toxicity for Reproduction	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
STOT-SE	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
STOT-RE	EU/CLP • Specific Target Organ Toxicity Repeated Exposure 1 OSHA HCS 2012 • Specific Target Organ Toxicity Repeated Exposure 1

Potential Health Effects

Inhalation

Acute (Immediate)

- Exposure to dust may cause irritation. Processes such as cutting, grinding, crushing, or impact may result in generation of excessive amounts of airborne dusts in the workplace. Nuisance dust may affect the lungs but reactions are typically reversible.

Chronic (Delayed)

- Overexposure to breathing asbestos may cause asbestosis, pulmonary fibrosis, mesothelioma, other lung disorders or cancer. All types of asbestos are known to cause inflammatory changes in lungs and pleurae. However, there is experimental and epidemiologic evidence that there may be differences in the potential of different asbestos types to produce disease. It has been suggested that crocidolite has greatest potential to produce disease; chrysotile, the smallest; with amosite occupying an intermediate position.

Skin

Acute (Immediate)

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed) • No data available

Eye

Acute (Immediate) • Exposure to dust may cause mechanical irritation. Excessive concentrations of nuisance dust in the workplace may reduce visibility and may cause unpleasant deposits in eyes.

Chronic (Delayed) • No data available

Ingestion

Acute (Immediate) • Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed) • No data available

Carcinogenic Effects • Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects				
	CAS	OSHA	IARC	NTP
Asbestos, chrysotile	12001-29-5	Specifically Regulated Carcinogen	Group 1-Carcinogenic	Known Human Carcinogen

Key to abbreviations

TC = Toxic Concentration

TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN2590	Asbestos, chrysotile	9	III	NDA
IMO/IMDG	UN2590	ASBESTOS, CHRYSOTILE	9	III	NDA
IATA/ICAO	UN2590	White Asbestos (Chrysotile)	9	III	NDA

14.6 Special precautions for user • None specified.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code • Data lacking.

Section 15 - Regulatory Information

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

SARA Hazard Classifications • Chronic

Inventory						
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	TSCA
Asbestos, chrysotile	12001-29-5	No	No	No	No	No

Canada

Labor

Canada - WHMIS 1988 - Classifications of Substances

• Asbestos, chrysotile 12001-29-5 D2A

Canada - WHMIS 1988 - Ingredient Disclosure List

• Asbestos, chrysotile 12001-29-5 0.1 %

Environment

Canada - CEPA - Priority Substances List

• Asbestos, chrysotile 12001-29-5 Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Asbestos, chrysotile 12001-29-5 Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Asbestos, chrysotile 12001-29-5 1.0 fiber/cm³ Excursion Limit (See 29 CFR 1910.1001, 30 min); 0.1 fiber/cm³ TWA

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Asbestos, chrysotile 12001-29-5 Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Asbestos, chrysotile 12001-29-5 Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - CERCLA/SARA - Section 313 - Emission Reporting		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing		
• Asbestos, chrysotile	12001-29-5	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - California - Proposition 65 - Developmental Toxicity		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
• Asbestos, chrysotile	12001-29-5	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
• Asbestos, chrysotile	12001-29-5	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Revision Date	• 19/December/2016
Preparation Date	• 14/January/2016
Disclaimer/Statement of Liability	• Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues of fluids. The information and recommendations set forth above are taken from sources believed to be accurate as of the date hereof, however SPI Supplies and Structure Probe, Inc. make no warranty with respect to the accuracy of the information or the

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Key to abbreviations

NDA = No Data Available

Appendix B

Preliminary Conceptual Site Model

CONTENTS

- ADEC Scoping Form
- ADEC Graphic Form.

ADEC SCOPING FORM

APPENDIX B: PRELIMINARY CONCEPTUAL SITE MODEL

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:

File Number:

Completed by:

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources (*check potential sources at the site*)

- USTs
- ASTs
- Dispensers/fuel loading racks
- Drums
- Vehicles
- Landfills
- Transformers
- Other:

Release Mechanisms (*check potential release mechanisms at the site*)

- Spills
- Leaks
- Direct discharge
- Burning
- Other:

Impacted Media (*check potentially-impacted media at the site*)

- Surface soil (0-2 feet bgs*)
- Subsurface soil (>2 feet bgs)
- Air
- Sediment
- Groundwater
- Surface water
- Biota
- Other:

Receptors (*check receptors that could be affected by contamination at the site*)

- Residents (adult or child)
- Commercial or industrial worker
- Construction worker
- Subsistence harvester (i.e. gathers wild foods)
- Subsistence consumer (i.e. eats wild foods)
- Site visitor
- Trespasser
- Recreational user
- Farmer
- Other:

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

If the box is checked, label this pathway complete:

Complete

Comments:

Contamination of hazardous materials may be present in the surface soil. Contamination may be brought to the surface during construction activities.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

Contaminant of potential concern include heating oil. An AST and UST containing diesel are present in the site vicinity, and the UST will be excavated during construction. Contaminants listed in Appendix B include naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Water for the airport structures is provided by an existing well. Contaminants are not expected to be in the groundwater, but may migrate to groundwater in the future.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Surface water is not in the vicinity of potential contamination at the Cordova Airport.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

The Cordova Airport is not in an urban area, but we suspect the contamination has not spread beyond the airport boundaries, not affecting the biota.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

Volatile contaminants include constituents of heating oil. Excavation activities could unearth the contaminated soil, which would affect outdoor air quality. Demolition of the structures could mobilize asbestos dust, which could affect indoor and/or outdoor air quality.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



If both boxes are checked, label this pathway complete:

Complete

Comments:

Contaminants may be present in the soil or groundwater.

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:

Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:

Comments:

4. Other Comments (*Provide other comments as necessary to support the information provided in this form.*)

The scope of the project associated with this CSM does not include a complete site characterization or delineation of potential contamination.

ADEC GRAPHIC FORM

APPENDIX B: PRELIMINARY CONCEPTUAL SITE MODEL

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Aircraft Rescue and Fire Fighting Building, Cordova Airport

Completed By: Rachel Willis

Date Completed: 2/3/20

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Media	(2) Transport Mechanisms
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Surface Water	<input checked="" type="checkbox"/> Direct release to surface water <i>check surface water</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Exposure Media	(4) Exposure Pathway/Route	(5) Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input checked="" type="checkbox"/> Inhalation of Fugitive Dust		F	F	F			
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water		F	F	F			
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust		F	F	F			
<input checked="" type="checkbox"/> surface water	<input checked="" type="checkbox"/> Ingestion of Surface Water <input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

Appendix C

Field Forms

CONTENTS

- Sample Collection Log
- Log of Boring
- Chain-of-Custody Record
- Asbestos Chain-of-Custody Record
- Asbestos Bulk Sampling Form
- Field Activities Daily Log
- Field Observation Report

SAMPLE COLLECTION LOG

APPENDIX C: FIELD FORMS

LOG OF BORING

APPENDIX C: FIELD FORMS

DRILL COMPANY/DRILLER: _____ DRILL RIG EQUIPMENT: _____ DRILLING METHOD: _____ HAMMER TYPE: _____ ROD TYPE/DIA.: _____ HAMMER WEIGHT: _____ HAMMER DROP: _____ CASING SIZE/TYPE: _____ HOLE SIZE: _____	JOB NO: _____ BORING NO: _____ JOB NAME: _____ LOGGED BY: _____ LOCATION: _____ ELEV.: _____ START DATE: _____ END DATE: _____ WEATHER DURING DRILLING: _____
--	--

SAMPLE DATA

TIME DATE	SAMP. NO. TYPE	FROM DEPTH TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	FIELD CLASSIFICATION
									[density/consistency; color; slightly, minor, MAJOR, then trace constituents; moisture; structure; other; USCS classification (geology)]

SUMMARY FIELD LOG OF BORING			
DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		

COMMENTS (i.e. materials used, visitors, problems, etc.):

GROUNDWATER DATA		
WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE _____ SAMPLES: _____ Attempted
 DRILLED: _____ Recovered

DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.

OTHER: _____

BORING: _____ SHEET _____ OF _____

CHAIN-OF-CUSTODY RECORD

APPENDIX C: FIELD FORMS



SHANNON & WILSON, INC.
 Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100 Seattle, WA 98103 (206) 632-8020
 2355 Hill Road Fairbanks, AK 99709 (907) 479-0600
 2043 Westport Center Drive St. Louis, MO 63146-3564 (314) 699-9660
 5430 Fairbanks Street, Suite 3 Anchorage, AK 99518 (907) 561-2120
 1200 17th Street, Suite 1024 Denver, Co 80202 (303) 825-3800

CHAIN-OF-CUSTODY RECORD

Laboratory _____ Page _____ of _____
 Attn: _____

Analysis Parameters/Sample Container Description
 (include preservative if used)

Sample Identity	Lab No.	Date Sampled	Time	Comp. Grab	Total Number of Containers	Remarks/Matrix

Project Information	Sample Receipt	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Project Number: _____	Total Number of Containers: _____	Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: _____
Project Name: _____	COC Seals/Intact? Y/N/NA: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Contact: _____	Received Good Cond./Cold Delivery Method: _____	Company: _____	Company: _____	Company: _____
Ongoing Project? Yes <input type="checkbox"/> No <input type="checkbox"/>	Sampler: _____ (attach shipping bill, if any)	Received By: 1. Signature: _____ Time: _____ Printed Name: _____ Date: _____ Company: _____		
Instructions		Received By: 2. Signature: _____ Time: _____ Printed Name: _____ Date: _____ Company: _____		
Requested Turnaround Time: _____		Received By: 3. Signature: _____ Time: _____ Printed Name: _____ Date: _____ Company: _____		
Special Instructions: _____				

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
 Yellow - w/shipment - for consignee files
 Pink - Shannon & Wilson - Job File

ASBESTOS CHAIN-OF-CUSTODY RECORD



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

EMSL ANALYTICAL, INC.
3317 3RD AVE S, SUITE D
SEATTLE, WA 98134
PHONE: (206)269-6310
FAX: (206)900-8789

Company : Shannon & Wilson, Inc.		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different <small>If Bill to is Different note instructions in Comments**</small>	
Street: 2355 Hill Road		<i>Third Party Billing requires written authorization from third party</i>	
City: Fairbanks	State/Province: AK	Zip/Postal Code: 99709	Country: USA
Report To (Name):		Fax #: 206-695-6777	
Telephone #:		Email Address:	
Project Name/Number:			
Please Provide Results: <input type="checkbox"/> Fax <input type="checkbox"/> Email		Purchase Order:	U.S. State Samples Taken:

Turnaround Time (TAT) Options* – Please Check

3 Hours
 6 Hours
 24 Hrs
 48 Hrs
 3 Days
 4 Days
 5 Days
 10 Days

*For TEM Air 3 hours/6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA PLM - Bulk (reporting limit) <input type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Air <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312 TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5 TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking	TEM- Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167) Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative) Other: <input type="checkbox"/>
--	--	--

Check For Positive Stop – Clearly Identify Homogenous Group

Samplers Name:	Samplers Signature:
-----------------------	----------------------------

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled

Client Sample # (s): -	Total # of Samples:
-------------------------------	----------------------------

Relinquished (Client):	Date:	Time:
-------------------------------	--------------	--------------

Received (Lab):	Date:	Time:
------------------------	--------------	--------------

Comments/Special Instructions:



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only):*

EMSL ANALYTICAL, INC.
3317 3RD AVE S, SUITE D
SEATTLE, WA 98134
PHONE: (206)269-6310
FAX: (206)900-8789

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
*Comments/Special Instructions:			

ASBESTOS BULK SAMPLING FORM

APPENDIX C: FIELD FORMS

Asbestos Bulk Sample Form

Building:

Date:

Sampler:

Material:

Location:

Pipe/Tank

- insulation
- elbow
- fitting
- transite pipe
- gasket
- tank insulation

Flooring

- 12 x 12 tile
- 9 x 9 tile
- linoleum
- mastic

Structural

- fireproofing

HVAC

- insulation
- tape

Ceiling

- popcorn
- textured
- suspended tile
- glued-on tile
- mastic

Wall

- sheetrock
- textured wall
- transite panel

Roofing

- shingle
- rolled
- felt
- tar
- transite shingle

Misc

- transite siding
- lab bench
- window putty
- other: _____

Floor: _____

Room: _____

Location: **N** **S** **E** **W**

 wall floor ceiling

 above ceiling other: _____

Sample No.: _____

Color: _____

Quantity: _____

Comments: _____

Pipe/Tank

- insulation
- elbow
- fitting
- transite pipe
- gasket
- tank insulation

Flooring

- 12 x 12 tile
- 9 x 9 tile
- linoleum
- mastic

Structural

- fireproofing

HVAC

- insulation
- tape

Ceiling

- popcorn
- textured
- suspended tile
- glued-on tile
- mastic

Wall

- sheetrock
- textured wall
- transite panel

Roofing

- shingle
- rolled
- felt
- tar
- transite shingle

Misc

- transite siding
- lab bench
- window putty
- other: _____

Floor: _____

Room: _____

Location: **N** **S** **E** **W**

 wall floor ceiling

 above ceiling other: _____

Sample No.: _____

Color: _____

Quantity: _____

Comments: _____

Pipe/Tank

- insulation
- elbow
- fitting
- transite pipe
- gasket
- tank insulation

Flooring

- 12 x 12 tile
- 9 x 9 tile
- linoleum
- mastic

Structural

- fireproofing

HVAC

- insulation
- tape

Ceiling

- popcorn
- textured
- suspended tile
- glued-on tile
- mastic

Wall

- sheetrock
- textured wall
- transite panel

Roofing

- shingle
- rolled
- felt
- tar
- transite shingle

Misc

- transite siding
- lab bench
- window putty
- other: _____

Floor: _____

Room: _____

Location: **N** **S** **E** **W**

 wall floor ceiling

 above ceiling other: _____

Sample No.: _____

Color: _____

Quantity: _____

Comments: _____

Pipe/Tank

- insulation
- elbow
- fitting
- transite pipe
- gasket
- tank insulation

Flooring

- 12 x 12 tile
- 9 x 9 tile
- linoleum
- mastic

Structural

- fireproofing

HVAC

- insulation
- tape

Ceiling

- popcorn
- textured
- suspended tile
- glued-on tile
- mastic

Wall

- sheetrock
- textured wall
- transite panel

Roofing

- shingle
- rolled
- felt
- tar
- transite shingle

Misc

- transite siding
- lab bench
- window putty
- other: _____

Floor: _____

Room: _____

Location: **N** **S** **E** **W**

 wall floor ceiling

 above ceiling other: _____

Sample No.: _____

Color: _____

Quantity: _____

Comments: _____

FIELD ACTIVITIES DAILY LOG

APPENDIX C: FIELD FORMS

FIELD OBSERVATION REPORT

APPENDIX C: FIELD FORMS

PROJECT NO.	.....
DATE	.....
S&W FIELD REP.	.....

FIELD OBSERVATION REPORT

PROJECT NAME/LOCATION
-----------------------	-------

REPORT SUBMITTED TO	CONTRACTOR NAME AND CONTACT	TIMES OF SITE VISITS
Client	General	from to
CC	Subcontractors	from to
.....	.....	from to
.....	.....	Weather & temp:

CONSTRUCTION OBSERVATIONS

TOPIC AND LOCATION	DESCRIPTION OF FIELD ACTIVITY AND OBSERVATIONS	RECOMMENDATIONS

Attachments	.....

OTHER GENERAL NOTES

Meetings Attended	.....
Other	.....

<i>LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field technician is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, procedures, construction site safety, quality of work, and adherence to the contract documents.</i>	REVIEW BY (initial/date)
	Page ___ of ___

Important Information

About Your Environmental Report

IMPORTANT INFORMATION

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations may be provided. However, Shannon & Wilson neither warrants repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request

the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that

identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

IMPORTANT INFORMATION