Quality Assurance Project Plan (QAPP)

701 South Jackson Street
Seattle, Washington

for
701 South Jackson Partners, LLC
c/o Housing Diversity Corp

July 28, 2023

GeoEngineers
Earth Science + Technology

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File No. 24504-001-03

July 28, 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym/ Abbreviation	Description
AGO	Attorney General's Office
ASTM	ASTM International
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, xylene
CMMP	Contaminated Media Management Plan
COC	chain-of-custody
cPAH	carcinogenic polycyclic aromatic hydrocarbons
CUL	cleanup levels
DQO	data quality objective
Ecology	Washington State Department of Ecology
EDD	electronic data deliverable
EIM	Environmental Information Management system
EPA	United States Environmental Protection Agency
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
KM	Kaplan-Meier
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MDL	method detection limit
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
MTCA	Model Toxics Control Act
NAD	North American Datum
NAVD	North American Vertical Datum
OSHA	Occupational Safety and Health Administration
PARCC	Precision, Accuracy, Representativeness, Completeness, and Comparability
PID	photoionization detector

PPCD	Prospective Purchaser Consent Decree
PPE	personal protective equipment
ppm	part per million
PQL	practical quantitation limit
Property	701 South Jackson Street
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RL	reporting limit
ROW	right-of-way
RPD	relative percent difference
Site	Seventh Avenue Service Site
SOP	standard operating procedure
South Jackson Partners	South Jackson Partners, LLC
TAT	turnaround time
TBD	to be determined
TEF	toxicity equivalency factor
TEQ	toxicity equivalent (refers to concentration basis)
TPH	total petroleum hydrocarbon
TRL	target reporting limit
VOC	volatile organic compound
VPC	volatile petroleum compound
WAC	Washington Administrative Code
%D	percent difference
%R	percent recovery

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) is prepared for the Seventh Avenue Service Site (Site) for use during the upcoming earthwork activities associated with the redevelopment of the 0.31-acre property located at 701 South Jackson Street (Property) in the Chinatown-International District neighborhood of Seattle, Washington. To facilitate cleanup as part of project construction, 701 S Jackson Partners, LLC (South Jackson Partners) entered into Prospective Purchaser Consent Decree (PPCD) No. 22-2-15886-7 SEA with the Washington State Department of Ecology (Ecology), and the Assistant Attorney General, Ecology Division (AGO), to facilitate cleanup as part of project construction.

Redevelopment plans for the Property include a new eight-story building with affordable housing and ground level commercial retail space. As part of the redevelopment, the existing buildings and structures will be demolished followed by Property-line to Property-line excavation of soils to a depth of approximately 15 to 20 feet below ground surface (bgs; Elevation 85 to 80 feet[1]) and subsequent construction of the new building. This QAPP describes compliance monitoring activities and presents quality assurance (QA) and quality control (QC) requirements applicable to the cleanup during construction for Property redevelopment.

The QAPP was prepared following the Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology 2004), United States Environmental Protection Agency (EPA) Requirements for Quality Assurance Project Plans (EPA 2001), Guidance for Quality Assurance Project Plans (EPA 2002), and EPA's National Functional Guidelines for Inorganic and Organic Superfund Methods Data Review (EPA 2017a and 2017b). This QAPP presents the objectives, procedures, organization, functions, activities, and specific QA/QC activities designed to achieve the data quality objectives (DQOs) established for the project, and to produce data that are scientifically valid, of known and acceptable quality, and meet established objectives. QA/QC procedures will be implemented so that the precision, accuracy, representativeness, completeness, and comparability (PARCC) of the data generated meet the specified DQOs to the maximum extent possible.

2.0 COMPLIANCE MONITORING

2.1. Protection Monitoring

Protection monitoring will be completed to confirm that human health and the environment are adequately protected during the remedial/cleanup actions conducted during project construction.

2.1.1. Worker Health and Safety

Remedial activities during construction will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (OSHA; 29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants. A site-specific Health and Safety Plan (HASP) is included as an appendix to the Contaminated Material Management Plan (CMMP; GeoEngineers 2023) for the remedial/cleanup action and addresses protection monitoring requirement for GeoEngineers' personnel. The South Jackson

[1] Elevations in this document are referenced to North American Vertical Datum 1988 (NAVD88).

Partners' construction contractor (contractor) will be required to prepare and submit a separate HASP for use by the contractor's personnel.

2.1.2. Environmental Protection

Environmental protection measures consisting of Best Management Practices (BMPs) for stormwater, sediment, drainage, and erosion control; dust and noise control; spill prevention and pollution control; and other controls needed to protect environmental quality will be implemented. Environmental protection measures including installation, inspection and maintenance necessary for stormwater management, control of surface water runoff, and temporary erosion and sediment control measures will be described by the contractor prior to commencing construction activities. The minimum standards for environmental protection measures that will be implemented are described in the CMMP. If South Jackson Partners or Ecology determines that the contractor's environmental protection measures are inadequate to meet the intent of applicable regulations, the contractor will be required to implement additional stormwater runoff, erosion control, or spill prevention and control measures to address the deficiencies.

2.2. Performance Monitoring

Performance monitoring will be conducted to verify that the CMMP achieves soil remediation/cleanup levels and/or to document contaminant concentrations that will be left in place. As described in the CMMP, the excavation to remove the source of Site contamination, and therefore any contamination observed at the Property boundaries will be left in place and documented so that it can be addressed as part of the final cleanup action for the Site. Because residual soil contamination will remain in place beneath portions of the 7th Avenue South and South Jackson Street Rights-of-Way (ROWs) following construction, a vapor barrier will be included in the project design to prevent vapor intrusion by residual contaminants into the occupied spaces of the new building and protect the future residents, retail space workers, and user of the Property. Performance monitoring activities will include confirmation soil sampling and analysis as described below.

2.2.1. Confirmation Soil Sampling and Analysis

Soil confirmation samples will be collected by GeoEngineers field personnel from the base and/or sidewalls of the remedial excavation as described in the CMMP. Soil samples from the base of the excavation will be collected at a frequency of one sample per 625 square feet. If the area of the base is less than 625 square feet, a minimum of one base sample will be obtained. Sidewall samples will be collected at a frequency of one sample per 40 linear feet of sidewall along the perimeter of the excavation. Sidewall samples will be collected at a depth where field screening evidence of contamination is the highest. If the sidewall does not have field screening evidence of contamination, the sidewall will be collected immediately above the water table (saturated zone, if present). At a minimum, four-sidewall samples will be obtained (i.e., one sample per sidewall assuming a four-sided excavation). One duplicate soil sample will be collected per every 20 parent soil samples collected from excavation limits for QA/QC purposes.

Soil samples will be collected by GeoEngineers' field personnel using a clean pair of nitrile gloves and placed in clean laboratory provided containers for chemical analysis. Reusable sampling equipment (if used) will be decontaminated prior to sample collection at each location. Each sample container will be securely capped, labeled, and placed in a cooler with ice immediately upon collection. The field representative will visually classify the soils in accordance with ASTM International (ASTM) Method D 2488 (Standard Practice for Description and Identification of Soils [Visual Manual Procedure]) and record soil

descriptions and other relevant field screening details (e.g., staining, debris, odors, etc.) in the field log. Field screening, decontamination, sample container, labeling, and handling procedures are described in Section 5.

Chemical analysis will be performed at an Ecology accredited laboratory. Chain-of-custody forms will be used to document the transfer of samples during transport and submittal of samples to the laboratory. The following analysis will be performed on confirmation soil samples:

- Gasoline-range total petroleum hydrocarbon (TPH) by method NWTPH-Gx
- Diesel- and Heavy Oil-range total petroleum hydrocarbon (TPH) by method NWTPH-Dx
- Benzene, toluene, ethylbenzene, xylene (BTEX) by EPA method 8260
- Naphthalenes and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA method 8270
- Lead by EPA method 6020

Confirmation soil samples collected to document contaminant concentrations that will be left in place within the South Jackson Street and/or 7th Avenue ROW will be analyzed at a standard (7 to 10 days) TAT or as determined based on field conditions. Confirmation soil samples collected to verify compliance with the Ecology Model Toxics Control Act (MTCA) cleanup levels (CULs) will be analyzed on an expedited 2-day TAT to support decision-making in the field concerning any additional excavation that may be required to achieve compliance with the cleanup levels. Confirmation soil samples will be subject to an EPA defined Stage 2B data validation and submitted to Ecology's Environmental Information Management (EIM) database.

Table 1 summarizes the analytical methods, sample size, containers, preservation and holding times for above mentioned laboratory analysis. Sufficient volume will be collected for each sample to perform each of the listed analyses. The results of the confirmation soil sample analyses will be compared to soil remediation levels presented in the CMMP. Data validation will be completed as described in Section 6. The results will be submitted to Ecology's EIM database following data validation.

3.0 PROJECT MANAGEMENT AND ORGANIZATION

The project management and organization elements for the remedial/cleanup action including the key personnel, roles and responsibilities of the participants and special training/certification are presented in the following sections.

3.1. Project Organization and Responsibilities

Key individuals and positions providing QA and QC are summarized in the following table. A description of the responsibilities, lines of authority and communication for the key individuals and positions providing QA and QC is presented below.

Project Role	Name and Organization	Contact Information
Project Coordinator	Bobby Tiscareno South Jackson Partners	206.915.9702 robertt@housingdiversity.com 159 South Jackson Street Seattle, Washington 98104
Technical Project Manager	Tim Syverson GeoEngineers	206.605.9236 tsyverson@geoengineers.com 2101 4th Avenue, Suite 950 Seattle, Washington 98121
Task Manager	Robert Trahan GeoEngineers	206.240.2300 rtrahan@geoengineers.com 2101 4th Avenue, Suite 950 Seattle, Washington 98121
Field Coordinator/Field Personnel	Paul Robinette GeoEngineers	253.278.0273 probinette@geoengineers.com 1101 Fawcett Avenue, Suite 200 Tacoma, Washington 98402
Health and Safety Manger	Lucas Miller GeoEngineers	509.209.2830 lmiller@geoengineers.com 523 East Second Avenue Spokane, Washington 99202
Data Quality Assurance Leader	Christine Ransom EcoChem	206.233.9332 cransom@ecochem.net 500 Union Street, Suite 1010 Seattle, Washington 98101
Laboratory Manager	Briana Barnes Fremont Analytical	206.352.3790 bbarnes@fremontanalytical.com 3600 Fremont Avenue N Seattle, Washington 98103

3.1.1. South Jackson Partners Project Coordinator

The South Jackson Partners' project coordinator duties consist of implementing the project approach and tasks, overseeing the project team members during performance of project tasks.

3.1.2. Technical Project Manager

The technical project manager is responsible for fulfilling contractual and administrative control of the project. The technical project manager's duties include defining the project approach and tasks, selecting project team members and establishing budgets and schedules.

The technical project manager's duties also include implementing the project approach and tasks, overseeing project team members during performance of project tasks, adhering to and communicating the status of budgets and schedules to the South Jackson Partners project manager, providing technical oversight, and providing overall production and review of project deliverables.

3.1.3. Task Manager

The task manager is responsible for the daily management of project tasks including providing technical direction to the field staff, produces task specific documents and supporting documents, develops schedules and allocates resources for field tasks, coordinates data collection activities to be consistent with information requirements, supervises the compilation of field data and laboratory analytical results, assures that data are correctly and completely reported, implements and oversees field sampling in accordance with project plan and supervises field personnel. Additionally, the task manger coordinates work with on-site subcontractors, verifies that appropriate sampling, testing, and measurement procedures are followed, coordinates the transfer of field data, sample tracking forms, and log books to the technical project manager for data reduction and validation, and participates in QA corrective actions as required.

3.1.4. Field Coordinator

The field coordinator will lead the field sampling effort for the project, serving as the direct point of contact between the task manager, analytical laboratory and subcontractors; and ensures that the appropriate sampling containers, chain-of-custody (COC) forms and field sampling gear including personal protective equipment (PPE) are available. The field coordinator ensures that data collection activities are consistent with information requirements and to assure that field information is correctly and completely reported for the entire duration of the project. The field coordinator will also coordinate appropriate sampling, testing, and measurement procedures and schedule sample delivery/shipment with the analytical laboratory. The field coordinator will transfer field data and sample tracking forms to the project file and data reduction and validation and participate in QA corrective actions as required.

3.1.5. Field Personnel

Field personnel have the primary responsibility for duties involving field data collection and documentation. Technical/field staff are responsible for:

- Understanding and following the CMMP, QAPP and HASP.
- Checking all equipment and supplies in advance of field operations.
- Ensuring that samples are properly collected, preserved, labeled, packaged, and shipped.
- Ensuring that all field data are carefully recorded in accordance with the remedial action and supporting documents.
- Following COC procedures and standard operating procedures (SOPs) when they are required.

3.1.6. Health and Safety Manager

The health and safety manager will oversee implementation of health and safety programs and verify that work on the project proceeds in accordance with the site-specific HASP.

3.1.7. Quality Assurance Leader

The quality assurance leader will provide oversight required for the completion of sample analyses for the project and verify, in conjunction with the laboratory manager, that the analytical work is proceeding in accordance with internal laboratory standard practices and the QA/QC guidelines for the project. This person will also oversee the completion of data validation activities completed for this project. The quality assurance leader maintains independence from the individual(s) generating the data.

3.1.8. Laboratory Project Manager

The laboratory project manager will fulfill the analytical requirements of this project including being responsible for sample analyses using appropriate analytical laboratory methods. The specific procedures to be used for COC transfer, internal calibrations, laboratory analyses, reporting, preventive instrument maintenance, and corrective action will follow standard protocols.

3.2. Special Training Requirements/Certification

The Superfund Amendments and Reauthorization Act of 1986 required the Secretary of Labor to issue regulations providing health and safety standards and guidelines for workers engaged in hazardous waste operations. OSHA regulations (29 CFR 1910.120) require training to provide employees with the knowledge and skills necessary to enable them to perform their jobs safely and with minimum risk to their personal health. All sampling personnel will have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and 8-hour refresher courses, as necessary, to meet OSHA regulations.

4.0 DATA QUALITY OBJECTIVES

The primary Data Quality Objectives (DQO) for this Cleanup Action are focused to collect environmental sampling data of known, acceptable, and documentable quality. The specific objectives established for the project are:

- Implement the procedures outlined herein for field sampling, sample custody, equipment operation and calibration, laboratory analysis, and data reporting to ensure consistency and thoroughness of data generated.
- Achieve the level of QA/QC required to produce scientifically valid analytical data of known and documented quality. This will be accomplished by establishing criteria for data precision, accuracy, representativeness, completeness, and comparability, and by evaluating project data against these criteria.

4.1. Chemical Quality Objectives

The sampling design, field procedures, usable laboratory procedures, and QC procedures established for this project were developed to provide defensible data. Specific factors that may affect data usability include quantitative factors (precision, bias, accuracy, completeness, and reporting limits) and qualitative factors such as representativeness and comparability. The specific DQOs associated with these data quality factors are discussed below. Method-specific DQOs for chemical laboratory analyses are presented in Table 2.

4.1.1. Analytical Detection Limits

Analytical methods have quantitative limitations at a given statistical level of confidence that are often expressed as the method detection limit (MDL). Although results reported near the MDL provide insight for contaminant conditions, quality assurance dictates that analytical methods achieve a consistently reliable level of detection known as the practical quantitation limit (PQL), which is typically demonstrated with the lowest point of a linear calibration. The contracted laboratory will provide numerical results for all analytes and report them as detected above the PQL or undetected at the PQL.

The PQLs provided by the Ecology-certified laboratory are presented in Table 3 for soil analyses. The PQLs presented in Table 3 are considered target reporting limits (TRLs) because several factors may influence final reporting limits. First, moisture and other physical conditions of samples affect detection limits. Second, analytical procedures may require sample dilutions or other practices to quantify a particular analyte at concentrations above the range of the instrument. The effect is that other analytes could be reported as undetected but at a value higher than a specified TRL. Data users must be aware that high non-detect values, although correctly reported, can bias statistical summaries and careful interpretation is required to correctly characterize subsurface conditions.

4.1.2. Precision

Precision is the measure of mutual agreement among replicate or duplicate measurements of an analyte from the same sample and applies to field duplicates (i.e., split samples), replicate analyses, and duplicate spiked environmental samples (matrix spike duplicates). The closer the measured values are to each other, the more precise the measurement process. Precision error may affect data usefulness. Good precision is indicative of relative consistency and comparability between different samples. Precision will be expressed as the relative percent difference (RPD) for spike sample and field duplicate comparisons of various matrices. The RPD is calculated as:

Where:

$$RPD\,(\%) = \frac{|\,D_1 - D_2\,|}{(D_1 + D_2)/2}\,X\,100,$$

D_1 = Concentration of analyte in primary sample.

D_2 = Concentration of analyte in duplicate sample.

The calculation applies to split samples, replicate analyses, duplicate spiked environmental samples (matrix spike duplicates), and laboratory control duplicates. The RPD will be calculated for samples and compared to the applicable criteria. Precision can also be expressed as the percent difference (%D) between replicate analyses. Project RPD goals for all analyses are presented in Table 2, unless the primary and duplicate sample results are less than 5 times the method reporting limit (MRL), in which case RPD goals will not apply for data quality assessment purposes.

4.1.3. Accuracy

Accuracy is a measure of bias in the analytical process. The closer the measurement value is to the true value, the greater the accuracy. Accuracy is typically evaluated by adding a known spike concentration of a target or surrogate compound to a sample prior to analysis. The detected concentration or percent recovery (%R) of the spiked compound reported in the sample provides a quantitative measure of analytical accuracy. Since most environmental data collected represent single points spatially and temporally rather than an average of values, accuracy is generally more important than precision in assessing the data. In general, if %R values are low, non-detect results may be reported for compounds of interest when in fact these compounds are present (i.e., false negative results), and results for detected compounds may be biased low. The reverse is true when %R values are high. In this case, non-detect values are considered accurate, whereas detected values may be higher than true values.

For this project, accuracy will be expressed as the %R of a known surrogate spike, matrix spike, or laboratory control sample (blank spike), concentration:

$$Recovery\,(\%R) = \frac{Spiked\ Result - Unspiked\ Result}{Known\ Spike\ Concentration}\,X\,100$$

Accuracy (%R) criteria for surrogate spikes, matrix spikes, and laboratory control samples (blank spikes) are presented in Table 2.

4.1.4. Representativeness, Completeness, and Comparability

Representativeness expresses the degree to which data accurately and precisely represent the actual site conditions. Representativeness of the data will be evaluated by:

- Comparing actual sampling procedures to those specified in this document.
- Reviewing analytical results for field duplicates to determine the variability in the analytical results.
- Invalidating non-representative data or identifying data to be classified as questionable or qualitative in nature. Only representative data will be used in subsequent data reduction, validation, and reporting activities.

Completeness establishes whether a sufficient amount of valid measurements were obtained to meet project objectives. The number of samples and results expected establishes the comparative basis for completeness. The completeness goal is 90 percent useable data for the samples/analyses planned. If the completeness goal is not achieved, an evaluation will be performed to determine if the data are adequate to meet study objectives.

Comparability expresses the confidence with which one set of data can be compared to another. Although numeric goals do not exist for comparability, a statement on comparability will be prepared to assess overall usefulness of data sets generated during the project, following the evaluation of precision and accuracy.

4.1.5. Holding Times

Holding times are defined as the time between sample collection and extraction, sample collection and analysis, or sample extraction and analysis. Recommended holding times are presented in Tables 1 and 2 for soil. If the analysis of an archived sample is required but the sample exceeds the respective holding time, either discard the sample and collect a new representative sample for analysis and/or consult with Ecology to determine if the sample may still be used.

4.1.6. Quality Control Blank Samples

According to the National Functional Guidelines for Organic Data Review (EPA 2017b), "The purpose of laboratory (or field) blank analysis is to assess the existence and magnitude of contamination resulting from laboratory (or field) activities. The criteria for evaluation of blanks apply to any blank associated with the samples (e.g., method blanks, instrument blanks, trip blanks, and equipment blanks)." Trip blanks are placed with samples for volatile analysis during shipment; method blanks are created during sample preparation and follow samples throughout the analysis process.

Analytical results for QC blanks will be interpreted in general accordance with EPA's National Functional Guidelines for Inorganic (EPA 2017a) and Organic Data (EPA 2017b) Review and professional judgment. QC blank samples are discussed further in Section 5.8.2.

5.0 DATA GENERATION AND ACQUISITION

The data generation and acquisition elements for the QAPP (as detailed below) address aspects of the project design and implementation including the appropriate methods for measurement and analysis, data collection or generation, data handling, and how QC activities are employed and properly documented. Sampling methods including field documentation, sampling, and decontamination procedures are also discussed below.

5.1. Surveying

Surveying at the site will be performed referencing vertical datum - North American Vertical Datum of 1988 (NAVD 88) and horizontal datum – North American Datum of 1983 (NAD 83). The contractor will perform excavation and post-construction as-built survey to document excavation limits and post-construction site conditions.

5.2. Field Screening Procedures

The potential presence of contamination in soil samples will be evaluated using field screening techniques. Field screening results will be recorded on the field logs and the results will be used as a general guideline to delineate areas of possible contamination. In addition, screening results will be used as a basis for selecting soil samples for laboratory chemical analysis. The following screening methods will be used: 1) visual screening; 2) water sheen screening; and 3) headspace vapor screening.

5.2.1.1. Visual Screening

The soil will be observed for unusual color and stains and/or odor indicative of possible contamination.

5.2.1.2. Water Sheen Screening

This is a qualitative field screening method that can help identify the presence or absence of petroleum hydrocarbons. A portion of the soil sample will be placed in a pan containing distilled water. The water surface will be observed for signs of sheen. The following sheen classifications will be used:

Classification	Identifier	Description
No Sheen	(NS)	No visible sheen on the water surface
Slight Sheen	(SS)	Light, colorless, dull sheen; spread is irregular, no rapid; sheen dissipates rapidly
Moderate Sheen	(MS)	Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on the water surface
Heavy Sheen	(HS)	Heavy sheen with color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on the water surface

5.2.1.3. Headspace Vapor Screening

This is a semi-quantitative field screening method that can help identify the presence or absence of volatile organic compounds (VOCs) in soil samples. A portion of the soil sample will be placed in a resealable plastic bag. The bag will then be sealed capturing air in the bag. The bag is then shaken gently to expose the soil to the air trapped in the bag. The bag will remain closed for approximately 5 minutes at ambient temperature before the headspace vapors are measured. Vapors present within the sample bag's headspace will be measured by inserting the probe of a photoionization detector (PID) through a small opening in the bag, taking care not to clog the probe with soil. The maximum PID reading (in parts per

million [ppm]) and the ambient air temperature will be recorded on the field log for each sample. The PID will be calibrated to 100 ppm isobutylene each day prior to soil sampling. No soil sample used for headspace screening will be submitted to the laboratory for chemical analysis.

5.3. Decontamination Procedures

Soil samples will be collected using excavation equipment (i.e., backhoe or excavator), hand tools including stainless steel spoons and/or directly from the excavation limits using a clean pair of nitrile gloves. Reusable sampling equipment that comes in contact with soil will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following:

1. Washing with a brush and non-phosphate detergent solution (e.g., Liqui-Nox and distilled water);
2. Rinsing with distilled water; and
3. Wrapping or covering the decontaminated equipment with aluminum foil. Field personnel will limit cross-contamination by changing gloves between sampling locations.

Drilling equipment (auger, soil sampler, direct-push barrel) that comes into contact with soil will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following:

1. Washing with pressurized hot water;
2. Wash with brush and non-phosphate detergent solution; and
3. Rinse with potable water.

Wash water used to decontaminate equipment will be collected and stored on-site in 55-gallon drums.

5.4. Sample Containers, Labeling, Handling and Custody

5.4.1. Sample Containers and Labeling

The Field Coordinator will establish field protocol to manage field sample collection, handling and documentation. Soil samples will be placed in appropriate laboratory-prepared containers. Sample containers and preservatives are listed in Tables 1 and 2 for soil.

Sample containers will be labeled with the following information at the time of sample collection:

- Project name and number
- Type of sample preservative used (where applicable)
- Sample name, which will include a reference to date and sampling depth (if applicable)
- Date and time of collection

The sample collection activities will be noted in the field log books. The Field Coordinator will monitor consistency between sample containers/labels, field log books and COC forms.

5.4.2. Sample Storage

Samples will be placed in a cooler with ice after they are collected. The objective of the cold storage will be to attain a sample temperature of 2 to 6 degrees Celsius. Holding times (Table 1) will be observed during sample storage.

5.4.3. Sample Shipment

Samples will be transported and delivered to the analytical laboratory in the sample coolers. The samples will either be transported by field personnel, laboratory personnel or by courier service. The Field Coordinator will ensure that the cooler has been properly secured using clear plastic tape and custody seals.

5.4.4. Chain-of-Custody Records

Field personnel are responsible for the security of samples from the time the samples are collected until the samples have been received by the courier service or laboratory personnel. A COC form will be completed for each group of samples being shipped to the laboratory. Information to be included on the COC form includes:

- Project name and number;
- Sample identification numbers;
- Date and time of sampling;
- Sample matrix (soil), preservative, and number of containers for each sample;
- Analyses to be performed;
- Names of sampling personnel;
- Project manager name and contact information including phone number; and
- Shipping information including shipping container number, if applicable.

The original COC form will be signed by a member of the field team. Field personnel will retain copies and place the original and remaining copies in a plastic bag. The plastic bag containing the COC form will be placed in the cooler before sealing the cooler for transport to the laboratory.

5.4.5. Laboratory Custody Procedures

The laboratory will follow their standard operating procedures (SOPs) to document sample handling from time of receipt (sample log-in) to reporting. Documentation will include, at a minimum, the analyst's name or initials, time and date.

5.5. Disposal of Investigation-Derived Materials

5.5.1. Disposition of Incidental Waste

Incidental waste generated during sampling activities includes items such as gloves, plastic sheeting, sample tubing, paper towels and similar expended and discarded field supplies. These materials are considered *de minimis* and will be disposed of in a local trash receptacle or county disposal facility.

5.6. Field Documentation

The field staff will be responsible for documenting field activities including sampling in an all-weather (e.g. "Rite-in-the-Rain") field notebook and/or on field logs, and by producing a draft technical field report at the end of each day of sampling. The field staff will also be responsible for implementing field QA/QC procedures in accordance with the methods outlined in this document and general good practice sampling protocols. These procedures include recording and documenting relevant and appropriate information regarding project activities, sampling methods and data collected during performance of field activities at each sample location.

The following general guidelines should be followed in documenting fieldwork:

- Documentation will be maintained in a dedicated field notebook and on field forms, as applicable.
- Notebook documentation will be completed in waterproof ink or permanent marker and written errors will be crossed out with a single line.

Field notebooks will include records of pertinent activities completed on site including sampling. Field notebooks will be bound books with sequentially numbered pages. The books will remain in the custody of the Field Coordinator/Personnel until project completion, after which, the books will be kept in the project files. The field notebook and forms will be maintained on a real-time basis and will include, where applicable and appropriate, the following information:

- Date, time of specific activities and weather conditions.
- Names of all personnel on the site, including visitors.
- Specific details regarding sampling activities, including sampling locations, type of sampling, depth, and sample numbers.
- Specific problems and resolutions.
- Identification numbers of monitoring instruments used that day.
- Chain-of-custody details, including sample identification numbers.

A draft field report will be prepared upon completion of field activities each day. Field data that was recorded in the notebooks and field forms will be used to complete the field report. The field report will be used to document construction, sampling, and monitoring activities, sampling and Site personnel, and weather conditions, as well as decisions, corrective actions, and/or modifications to the project plans and procedures discussed in this report. The draft field report will be finalized following review by the Task Manager and/or Technical Project Manager and kept in the project files.

5.7. Analytical Methods

Samples and QC samples shall be analyzed following the analytical methods listed in Tables 1 and 2 for soil, using laboratory instruments prescribed in the methods. The analytical methods must meet the technical acceptance criteria specified by the method prior to the analysis of environmental samples. Samples that are not analyzed initially (i.e., placed on "hold") will be stored at the laboratory for at least 1 month, and will be disposed of by the laboratory following this period. Samples to be analyzed initially will be analyzed within proper holding times, which are listed in Table 1.

The laboratory is required to comply with their current written standard operating procedures. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data to the laboratory project manager. A narrative describing the anomaly, the steps taken to identify and correct it and the treatment of the relevant sample batch (i.e., recalculation, reanalysis, re-extraction) will be submitted with the data package.

5.8. Quality Control

Quality control activities that will be implemented for each sampling, analysis or measurement technique are summarized in Table 2. Formulas for calculating QC statistics are provided in Section 4.1.

The laboratory will maintain and implement documented QA/QC procedures. The laboratory QA/QC program will provide the following:

- Procedures that must be followed for certifying the precision and accuracy of the analytical data generated by the laboratory.
- Documentation of each phase of sample handling, data acquisition, data transfer, report preparation, and report review.
- Accurate and secure storage and retrieval of samples and data.
- Detailed instructions for performing analyses and other activities affecting the quality of analytical data generated by the laboratory.
- Appropriate management-level review and approval of procedures, revisions to procedures, and control of procedures in such a way so that laboratory personnel that require specific procedures have access to them.

5.8.1. Field Quality Control

Field QC samples serve as a control and check mechanism to monitor the consistency of sampling methods and the potential influence of off-Site factors on project samples. Examples of off-Site factors include airborne VOCs and contaminants that may be present in potable water used during drilling activities.

5.8.1.1. Field Duplicates

In addition to replicate analyses performed in the laboratory, field duplicates also serve as measures for precision. Field duplicates measure the precision and consistency of laboratory analytical procedures and methods, as well as the consistency of the sampling techniques used by field personnel. Under ideal field conditions, field duplicates are created by thoroughly mixing a volume of the sample matrix, placing aliquots of the mixed sample in separate containers, and identifying one of the aliquots as the primary sample and the other as the duplicate sample. The frequency at which field duplicate samples will be collected is identified in Section 2 above.

5.8.1.2. Trip Blanks

Trip blanks consist of samples of reagent water that accompany samples to be analyzed for VOCs during sample storage in coolers and transport to the laboratory. They are used to assess potential contamination of samples during collection and transport due to the presence of VOCs in ambient air. Trip blanks will be analyzed on a one per cooler basis containing soil samples for VOC analysis.

5.8.2. Laboratory Quality Control

Laboratory QC procedures will be evaluated through a formal data quality assessment process. The analytical laboratory will follow standard analytical method procedures that include specified QC monitoring requirements. These requirements will vary by method, but generally include:

- Method blanks
- Internal standards
- Instrument calibrations
- Matrix spike/matrix spike duplicates (MS/MSD)
- Laboratory control samples/laboratory control sample duplicates (LCS/LCSD)
- Laboratory replicates or duplicates
- Surrogate spikes

5.8.2.1. Laboratory Blanks

Laboratory procedures utilize several types of blanks, but the most commonly used blanks for QC monitoring are method blanks. Method blanks are laboratory QC samples that consist of either a soil-like material having undergone a contaminant destruction process, or reagent (contaminant-free) water. Method blanks are extracted and analyzed with each batch of environmental samples undergoing analysis. Method blanks are particularly useful during volatiles analysis since VOCs can be transported in the laboratory through the vapor phase. If a substance is detected in a method blank, then one (or more) of the following occurred:

- Sample containers, measurement equipment, and/or analytical instruments were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance(s) of interest.
- Volatile substances in ambient laboratory air with high solubility or affinities toward the sample matrix contaminated the samples during preparation or analysis.

It is difficult to determine which of the above scenarios took place if blank contamination occurs. However, it is assumed that the conditions that affected the blanks also likely affected the project samples. If target analytes are detected in method blanks, data validation guidelines assist in determining which substances in project samples are considered "real," and which ones are attributable to the analytical process. Furthermore, the guidelines state, "…there may be instances where little or no contamination was present in the associated blank, but qualification of the sample is deemed necessary. Contamination introduced through dilution water is one example".

5.8.2.2. Calibrations

Several types of instrument calibrations are used, depending on the analytical method, to assess the linearity of the calibration curve and assure that the sample results reflect accurate and precise measurements. The main calibrations used are initial calibrations, daily calibrations, and continuing calibration verification.

5.8.2.3. Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSD samples are used to assess influences or interferences caused by the physical or chemical properties of the sample itself. For example, extreme pH can affect the results for SVOCs. Or, the presence of a particular compound may interfere with accurate quantitation of another analyte. MS/MSD data is reviewed in combination with other QC monitoring data to determine matrix effects. In some cases, matrix effects cannot be determined due to dilution and/or high levels of related substances in the sample. A matrix spike is evaluated by spiking a project sample with a known amount of one or more of the target analytes, ideally at a concentration that is 5 to 10 times higher than the sample result. A percent recovery is then calculated by subtracting the un-spiked sample result from the spiked sample result, dividing by the known concentration of the spike, and multiplying by 100.

MS/MSD samples will be analyzed at a frequency of one MS/MSD per sample set or batch. The samples for the MS/MSD analyses should be collected from a boring or sampling location that is believed to have only low-level contamination. A sample from an area of low-level contamination is needed because the objective of MS/MSD analyses is to determine the presence of matrix interferences, which can best be achieved with low levels of contaminants. Additional sample volume will be collected for the MS/MSD analyses as required by the laboratory.

5.8.2.4. Laboratory Control Sample/ Laboratory Control Sample Duplicates (LCS/LCSD)

Also known as blank spikes, LCSs are similar to MS samples in that a known amount of one or more of the target analytes are spiked into a prepared sample medium, and a percent recovery of the spiked substances is calculated. The primary difference between LCS and MS samples is that the LCS uses a contaminant-free sample medium. For example, reagent water is typically used for LCS water analyses. The purpose of an LCS is to help assess the overall accuracy and precision of the analytical process including sample preparation, instrument performance, and analyst performance.

5.8.2.5. Laboratory Replicates/Duplicates

Laboratories utilize MS/MSDs, LCS/LCSDs, and/or replicates to assess precision. Replicates are a second analysis of a field-collected environmental sample. Replicates can be split at varying stages of the sample preparation and analysis process; they most commonly consist of a second analysis on the extracted media.

5.8.2.6. Surrogate Spikes

Surrogate spikes are used to verify proper extraction procedures and the accuracy of the analytical instrument. Surrogates are substances with characteristics similar to the target analytes. A known concentration of surrogate is added to the project sample and passed through the instrument, and percent recovery is calculated. Each surrogate used has acceptance limits (i.e., an acceptable range) for percent recovery. If a surrogate recovery is low, sample results may be biased low and depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified acceptance limits, a possibility of false positives exist, although non-detect results are considered accurate.

5.9. Instrument/Equipment Testing, Inspection, and Maintenance

5.9.1. Field Instrumentation

If field instruments are used, calibration and calibration checks will be performed to facilitate accurate and reliable field measurements. The calibration of the instruments will be checked and adjusted as necessary in general accordance with manufacturers' recommendations. Methods and frequency of calibration

checks and instrument maintenance will be based on the type of instrument, stability characteristics, required accuracy, intended use, and environmental conditions.

5.9.2. Laboratory Instrumentation

For chemical analytical testing, calibration procedures will be performed in general accordance with the analytical methods used and the laboratory's Standard Operating Procedures (SOPs). Calibration documentation will be retained at the laboratory for a period of 6 months.

5.10. Laboratory Data Reporting and Deliverables

Laboratories will report data in formatted hardcopy and electronic form to the technical project manager, task manager and QA leader. Upon completion of analyses, the laboratory will prepare electronic deliverables for data packages in accordance with the specifications in the agreed-upon *Special Conditions for Lab Analysis* document. The laboratory will provide electronic data deliverables (EDDs) within 2 business days after GeoEngineers' receipt of printed-copy analytical results, including the appropriate QC documentation. GeoEngineers will establish EDD requirements with the contract laboratory.

Analytical laboratory measurements will be recorded in standard formats that display, at a minimum, the client/field sample identification, the laboratory sample identification, reporting units, analytical methods, analytes tested, analytical results, extraction and analysis dates, quantitation limits, and data qualifiers. Each sample delivery group will be accompanied by sample receipt forms and a case narrative identifying data quality issues.

6.0 DATA REDUCTION AND ASSESSMENT PROCEDURES

The processes for generating and checking data, as well as the process for producing reports for field and analytical laboratory data, are summarized in the following sections.

6.1. Data Reduction

Data reduction involves the conversion or transcription of field and analytical data to a useable format. The laboratory personnel will reduce the analytical data for review by the QA leader, task manager and technical project manager. This will involve both hard-copy forms and EDDs. Both forms of data will be compared with each other to verify that the data are reliable and error-free.

6.2. Review of Field Documentation and Laboratory Receipt Information

Documentation of field sampling data will be reviewed periodically for conformance with project QC requirements described in this document. At a minimum, field documentation will be checked for proper documentation of the following:

- Sample collection information (date, time, location, matrices, etc.);
- Field instruments used and calibration data;
- Sample collection protocol;
- Sample containers, preservation, and volume;
- Field QC samples collected at the frequency specified;

- Chain-of-custody protocols; and
- Sample shipment information.

Sample receipt forms provided by the laboratory will be reviewed for QC exceptions. The final laboratory data package will describe (in the case narrative) the effects that any identified QC exceptions have on data quality. The laboratory will review transcribed sample collection and receipt information for correctness prior to delivering the final data package.

6.3. Data Verification/Validation

Project decisions, conclusions, and recommendations will be based upon verified (validated) data. The purpose of data verification is to ensure that data used for subsequent evaluations and calculations are scientifically valid, of known and documented quality, and legally defensible. Field data verification will be used to eliminate data not collected or documented in accordance with the protocols specified in the remedial action and this document. Laboratory data verification will be used to eliminate data not obtained using prescribed laboratory procedures.

The QA leader will validate data collected during the remedial/cleanup action to ensure that the data are valid and usable. At a minimum, a Stage 2B validation will be performed on the remedial action data in general conformance with EPA functional guidelines for data validation (EPA 2004; and EPA 2008). At a minimum, the following items will be reviewed to verify the data as applicable:

- Documentation that a final review of the data was completed by the laboratory QA coordinator;
- Documentation of analytical and QC methodology;
- Documentation of sample preservation and transport;
- Sample receipt forms and case narratives; and
- The following QC parameters:
  - Holding times and sample preservation
  - Method blanks
  - MS/MSDs
  - LCS/LCSDs
  - Surrogate spikes
  - Duplicates/replicates

When sample analytical data are received from the analytical laboratory, they will undergo a QC review by the QA leader. The accuracy and precision achieved will be compared to the laboratory's analytical control limits. Example control limits are presented in Table 2. Calculations of RPDs will follow standard statistical conventions and formulas as presented in in this document. Additional specifications and professional judgment by the QA leader may be incorporated when appropriate data from specific matrices and field samples are available.

A data quality assessment will be prepared to document the overall quality of the data relative to the DQOs. The major components of the data quality assessment are as follows:

- **Data Validation Summary:** Summarizes the data validation results for all sample delivery groups by analytical method. The summary identifies any systematic problems, data generation trends, general conditions of the data, and reasons for any data qualification.
- **QC Sample Evaluation:** Evaluates the results of QC sample analyses, and presents conclusions based on these results regarding the validity of the project data.
- **Assessment of DQOs:** An assessment of the quality of data measured and generated in terms of accuracy, precision, and completeness relative to objectives established for the project.
- **Summary of Data Usability:** Summarizes the usability of data, based on the assessment performed in the three preceding steps.

The data quality assessment will help to achieve an acceptable level of confidence in the decisions that are to be made based upon the project data. The project analytical data will be submitted to Ecology's EIM system within 60 days after the data quality assessment is completed.

6.4. Calculating Chemical Sums

The following guidelines will be used to calculate chemical sums:

- Total cPAHs will be calculated using the toxicity equivalent (TEQ) approach in accordance with WAC 173-340-708(8)(e). Total cPAH TEQs will be calculated using toxicity equivalency factor (TEF) values referenced from MTCA Table 708.2 (WAC 173-340-900). For non-detect results, one-half the PQL will be used in the TEQ calculations.

For the summation of chemical totals, any "U" qualified data, which may be data reported at the PQL, the MDL, or the reporting limit (RL), represent non-detects. For the calculations, no distinction is made between these different types of detection limits, and any "U" qualified data are treated as "non-detects". The following guidelines will be used for reporting and summing non-detects for benzofluoranthenes:

- When all chemicals in a group are non-detect, only the single highest individual chemical quantitation limit in a group will be reported and appropriately qualified.
- If some concentrations were detected and others are not, only the detected concentrations are included in the sum.

Estimated values between the method detection limit and the laboratory reporting limit (i.e. "J" qualified results) will be included in the summation at face value and the sum will also be qualified as estimated with a "J" qualifier. Results that are qualified as estimates with "J" qualifiers through data validation, will also be handled in the same manner.

For calculating total cPAH TEQ, the sum will be calculated using a substitution at one-half the detection limit (i.e., n=1/2). However, using this alternative may result in generated sums that are estimates with unknown bias and precision. Therefore, these estimates will be bounded by reporting sums using a substitution of the detection limit at n=0 and n=1. As an alternative, the Kaplan-Meier (KM) method for estimating the TEQ sums when non-detected congeners are present within a sample may be used.

7.0 LIMITATIONS

We have prepared this Quality Assurance Project Plan (QAPP) for use by South Jackson Partners during the remedial/cleanup action at the Seventh Service Site located at 701 South Jackson Street in Seattle, Washington. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

8.0 REFERENCES

GeoEngineers Inc. 2023, "Contaminated Material Management Plan," prepared for South Jackson Partners, dated May 16, 2023.

U.S. Environmental Protection Agency (EPA) 2001, "EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5" EPA-240/B-01/003, Office of Environmental Information, Washington, DC, dated March 2001.

U.S. EPA 2002, "Guidance for Quality Assurance Project Plans, EPA QA/G-5," EPA-240/R-02/009, Office of Environmental Information, Washington, DC, dated December 2002.

U.S. EPA 2017a, "National Functional Guidelines for Inorganic Superfund Methods Data Review." OLEM 9355.0-135, EPA 540-R-2017-001, Office of Superfund Remediation and Technology Innovation (OSRTI), Washington, DC, dated January 2017.

U.S. EPA 2017b "National Functional Guidelines for Organic Superfund Methods Data Review." OLEM 9355.0-136, EPA 540-R-2017-002, Office of Superfund Remediation and Technology Innovation (OSRTI), Washington, DC, dated January 2017.

Washington State Department of Ecology (Ecology), 2004, "Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies," dated July 2004 and revised December 2016.

Table 1

Soil Sample Test Methods, Sample Size, Containers, Preservation and Holding Times

701 South Jackson Street

Seattle, Washington

Laboratory Analysis	Analytical Method	Minimum Sample Size	Sample Container	Sample Preservation	Holding Time[1]
Gasoline-Range Petroleum Hydrocarbons	NWTPH-Gx	5 g	Two 40mL glass vial (VOA)	Cool ≤6°C, 5mL MeOH	14 days to extraction/analysis
Diesel- and Heavy Oil-Range Petroleum Hydrocarbons	NWTPH-Dx	100 g	8-oz amber glass WM with Teflon-lined lid	Cool ≤6°C	14 days to extraction/analysis
VOCs (BTEX)	EPA 8260	5 g	Three 40mL glass vial (VOA)	Cool ≤6°C Two VOAs - Sodium Bisulfate One VOA - Methanol	14 days to extraction/analysis
PAHs	EPA 8270/SIM	100 g	8-oz glass WM with Teflon-lined lid	Cool ≤6°C	14 days to extraction, 40 days from extraction to analysis
Metals (Pb)	EPA 6020	100 g	4-oz glass WM with Teflon-lined lid	Cool ≤6°C	180 days

Notes:

[1] Holding times are based on elapsed time from date of collection.

NWTPH = Northwest total petroleum hydrocarbons

Gx = gasoline-range extended

Dx = diesel-range extended

EPA = United States Environmental Protection Agency

VOC = volatile organic compound

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

SIM = selected ion mode

g = gram

mL = milliliter

oz. = ounce

WM = wide mouth

Table 2

Measurement Quality Objectives

701 South Jackson Street

Seattle, Washington

Laboratory Analysis	Laboratory Control Sample (LCS) %R Limits[1,2]	Matrix Spike (MS) %R Limits[1,2]	Surrogate Standard (SS) %R Limits[1,2,3]	MS Duplicate Samples or Lab Duplicate RPD Limits[4] (%)	Field Duplicate Samples RPD Limits[4] (%)
	Soil	Soil	Soil	Soil	Soil
Gasoline-Range Petroleum Hydrocarbons	70-121	28-162	74-152	≤30	≤30
Diesel- and Heavy Oil-Range Petroleum Hydrocarbons	63-120	63-120	50 - 150	≤30	≤30
VOCs (BTEX)	Laboratory Specific Control Limits[1]	Laboratory Specific Control Limits[1]	80 - 120	≤30	≤30
PAHs	Laboratory Specific Control Limits[1]	Laboratory Specific Control Limits[1]	Laboratory Specific Control Limits[1]	≤30	≤30
Metals (Pb)	80 - 120	75 - 125	--	≤20	≤20

Notes:

[1]Compound-specific ranges will be provided by the laboratory when contracted.

[2]Percent recovery limits are expressed as ranges based on laboratory control limits. Limits will vary for individual analytes.

[3]Individual surrogate recoveries are compound-specific.

[4]RPD control limits are only applicable if the primary and duplicate sample concentrations are greater than 5 times the method reporting limit (MRL). For results less than 5 times the MRL, the difference between the primary and duplicate samples must be less than 2X the MRL for soil.

EPA = United States Environmental Protection Agency

cPAH = carcinogenic polycyclic aromatic hydrocarbons

VOCs = Volatile Organic Compounds

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

PAH = polycyclic aromatic hydrocarbons

Table 3

Method Analysis and Target Reporting Limits for Soil

701 South Jackson Street
Seattle, Washington

Laboratory Analysis	CAS Number[1]	Analytical Method	Practical Quantitation Limit (PQL) for Soil (mg/kg)
Petroleum Hydrocarbons			
Gasoline-Range	8006-61-9	NWTPH-Gx	5
Diesel-Range	68334-30-5	NWTPH-DX	50
Heavy Oil-Range	30109	NWTPH-DX	50
Volatile Organic Compounds (VOCs)			
Benzene	71-43-2	EPA 8260	0.02
Ethylbenzene	100-41-4	EPA 8260	0.05
Toluene	108-88-3	EPA 8260	0.05
Xylenes	1330-20-7	EPA 8260	0.05
Non-carcinogenic Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	91-20-3	EPA 8270-SIM	0.005
Carcinogenic PAHs (cPAHs)			
Benzo[a]anthracene	56-55-3	EPA 8270-SIM	0.005
Benzo[a]pyrene	50-32-8	EPA 8270-SIM	0.005
Benzo[b]fluoranthene	205-99-2	EPA 8270-SIM	0.005
Benzo[k]fluoranthene	207-08-9	EPA 8270-SIM	0.005
Chrysene	218-01-9	EPA 8270-SIM	0.005
Dibenz[a,h]anthracene	53-70-3	EPA 8270-SIM	0.005
Indeno[1,2,3-c,d]pyrene	193-39-5	EPA 8270-SIM	0.005
Metals			
Lead (Pb)	7439-92-1	EPA 6020	2

Notes:

[1] Chemical abstract service (CAS) registry number.

mg/kg = milligram per kilogram

EPA = United States Environmental Protection Agency