Soil Management Plan

Riverfront Park Redevelopment
Spokane, Washington

for
City of Spokane Parks and Recreation

June 23, 2016

GeoEngineers
Earth Science + Technology

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Soil Management Plan

Riverfront Park Redevelopment
Spokane, Washington

File No. 0110-148-04

June 23, 2016

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1.0 INTRODUCTION

This Soil Management Plan (SMP) provides soil handling recommendations for construction and maintenance activities for redevelopment projects and maintenance in Riverfront Park in downtown Spokane, Washington (herein referred to as the "Redevelopment Project" or "subject property"). The Redevelopment Project includes multiple projects throughout the 56-acre park and maintenance is expected to occur at the park indefinitely.

The subject property is shown relative to surrounding physical features on the Vicinity Map, Figure 1. Subject property layout is shown on the Site Plan, Figure 2. Acceptable soil uses for areas disturbed during construction activities is shown on Acceptable Soil Uses, Figure 3.

This SMP provides guidance to City of Spokane (City) employees and other contractors that perform earthwork activities at the subject property. The objectives of the plan are to: (1) disclose the potential presence of potential contaminants of concern (COCs); (2) minimize risks to worker health/safety and the environment; and (3) outline general procedures for handling and disposal of contaminated soil if encountered during construction activities. This plan does not address dewatering considerations that would be associated with deep excavations encountering groundwater.

2.0 BACKGROUND

The site is located at 507 North Howard Street in Spokane, Washington. The site is bounded by Spokane Falls Boulevard to the south, Post Street to the west, Washington and Division Streets to the east and the Spokane River and Mallon Avenue to the north. The property is currently owned by the City and is a public park. The site includes Havermale Island, Canada Island, and the portions of Riverfront Park on the north and south banks of the Spokane River.

Development at the subject property began in the late 1870s and primarily included mixed industrial uses and railroad activities. In 1973, the subject property underwent construction as the current park in preparation for Expo 1974. Historical records indicate that many of the historical areas were covered with fill as part of park construction and remnant impacts from industrial activities were generally unknown. Our understanding of the subject property, the comprised parcels, and historic uses of each is based on the results of our Phase I Environmental Site Assessment (ESA) for the subject property completed for the City (GeoEngineers 2014).

The Phase I ESA identified recognized environmental concerns at the subject property that may include the presence of petroleum hydrocarbons, metals, chlorinated solvents and polycyclic aromatic hydrocarbons (PAHs) in soil within the construction areas. Additionally, the Phase I ESA identified several underground storage tanks (USTs) previously in use at the subject property, some of which may remain in-place.

On April 4 and 5, 2016, GeoEngineers advanced 16 geotechnical and environmental borings to bedrock along the south bank around the Skyride Terminal and in the Gondola Meadow. Seven soil samples from select borings were analyzed for COCs and chemical analysis indicated the presence of PAHs greater than MTCA Method A for Unrestricted Land Uses cleanup criteria (Ecology 2013) in each of the samples analyzed. In addition, lead, cadmium, arsenic and residual oil range hydrocarbons were detected above

MTCA Method A for Unrestricted Land Uses cleanup criteria in boring B-13 and only lead was detected greater than MTCA Method A for Unrestricted Land Use in boring B-18. Lead, cadmium, arsenic and residual oil range hydrocarbons detected in samples from other borings above reporting limits, but below MTCA Method A Cleanup Criteria. Table 1 provides MTCA Method A Cleanup Criteria for known COCs at the subject property.

TABLE 1. MTCA METHOD A SOIL CLEANUP CRITERIA FOR UNRESTRICTED LAND USE

Parameter		MTCA Method A Unrestricted Land Use Cleanup Levels (mg/kg)
Total Petroleum Hydrocarbons	Gasoline Range Organics	100/30[1]
	Diesel Range Organics	2,000
	Heavy Oil	2,000
Metals	Arsenic	20
	Barium	NE
	Cadmium	2
	Chromium	2,000
	Lead	250
	Silver	NE
	Selenium	NE
	Mercury	2
PAHs	Benzo(a)pyrene	0.1
	Naphthalenes[2]	5
	cPAHs Toxic Equivalency[3]	0.1

Notes:

[1] Cleanup level is 100 mg/kg for gasoline mixtures without benzene and the total BTEX compounds are less than 1 percent of the total mixture. The cleanup level for all other gasoline mixtures is 30 mg/kg.

[2] Cleanup level for total naphthalenes (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene)

[3] Toxic equivalency for carcinogenic poly aromatic hydrocarbons (cPAHs) calculated using the toxic equivalency factors found in MTCA Table 708-2.

mg/kg = milligrams per kilogram; NE = Not Established

3.0 HEALTH AND SAFETY

Excavation and other major construction activities involving suspected contaminated soil shall be conducted by Hazardous Waste Operations and Emergency Response (HAZWOPER) trained personnel with a minimum of 24-hours training. In addition to HAZWOPER training, the earthwork subcontractor shall prepare a site-specific Health and Safety Plan (HASP) describing potential COCs and exposure pathways, appropriate personal protective equipment (PPE) requirements and emergency response plans. City employees conducting regular maintenance do not require HAZWOPER training.

4.0 ENVIRONMENTAL PROFESSIONAL

For major projects, an environmental professional shall be retained to observe and document excavations. The frequency and duration of on-site observation will depend on the nature of site soils for each particular project and the planned end use of excavated soil. Regular park maintenance shall not require the observation and documentation by an environmental professional. The environmental professional shall assist the contractor and City with: identifying potentially contaminated on-site fill; collecting profile and excavation soil samples; providing soil profile documentation; and obtaining disposal approval. The environmental professional also shall document the contaminated soil excavation and handling and provide the required reports to Washington State Department of Ecology (Ecology).

5.0 DOCUMENTATION

Information regarding the location and characteristics of Contaminated Soil or Impacted Soil shall be documented in a characterization report so that future activities completed in those affected or modified areas can be appropriately planned with regard to health and safety, characterization and soil management. Reports shall include:

- Descriptions of field or construction activities;
- Exploration, excavation or sampling locations;
- Dimensions of explorations or excavations;
- A description of the soil encountered; and
- Results of field screening or laboratory chemical analysis.

Reports shall be filed with local and state agencies.

6.0 SOIL CHARACTERIZATION

In support of the redevelopment of Riverfront Park, environmental sampling shall be conducted during design studies to characterize soil that might be encountered during major construction projects. As projects are designed, exploration locations shall be identified for investigation. Ideally, environmental sampling will be combined with geotechnical investigations to reduce assessment costs by collecting both environmental and geotechnical information at the same time. Environmental-focused exploration locations shall focus on areas where soil will be excavated. Supplemental investigations shall be defined by an environmental work plan specific to each project, and the environmental work plan shall include field screening methods, sampling and analysis procedures and a health and safety plan. Representative soil samples shall be submitted for laboratory chemical analysis to characterize environmental conditions. Based on the site history, COCs throughout the park include petroleum hydrocarbons, PAHs and metals. Chemical analysis shall include:

- Total Petroleum Hydrocarbons (NWTPH-HCID);
- PAHs (EPA 8270D); and
- Metals (EPA 6010):

- Arsenic;
- Barium;
- Cadmium;
- Chromium;
- Lead;
- Mercury;
- Selenium; and
- Silver.

Additional COCs might be identified for specific projects or areas of the park based on the results of the Phase I ESA.

If total metals are detected at a concentration equal to or exceeding 20 times the Resource Conservation and Recovery Act (RCRA) maximum toxicity characteristic concentration, the samples shall be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) to determine if leachable metals exceed RCRA toxicity concentrations. Soil with leachable metals concentrations greater than the RCRA regulatory limits shall be considered hazardous. Table 2 below summarizes the RCRA toxicity characteristic regulatory levels.

TABLE 2. MAXIMUM TOXICITY CHARACTERISTIC CONTAMINANT CONCENTRATIONS

Contaminant	TCLP Regulatory Level (mg/L)	Soil Concentration Requiring TCLP Analysis, 20x Regulatory Level (mg/kg)
Arsenic	5	100
Barium	100	2,000
Cadmium	1	20
Chromium	5	100
Lead	5	100
Mercury	0.2	4
Selenium	1	20
Silver	5	100

Notes: mg/L = milligrams per liter

If petroleum hydrocarbons are detected at concentrations greater than MTCA Method A, follow up analysis shall include more precise hydrocarbon analysis methods including NWTPH-Gx and NWTPH-Dx for gasoline-, diesel- and oil-range hydrocarbons, respectively. Some site soil might contain organic matter or man-made heavy oils such as cooking grease. NWTPH-Dx with silica gel cleanup will be used as applicable to reduce the potential for biogenic interference, provided initial NWTPH-Dx analyses indicate that non-TPH hydrocarbons could be a significant component of the TPH being detected in soil; or if comparative results of NWTPH-Dx with and without silica gel cleanup on the same samples indicate biogenic interference. Additional testing might be required if petroleum hydrocarbons are detected above laboratory reporting limits in accordance with MTCA Table 830-1, Required Testing for Petroleum Releases. This includes polychlorinated biphenyls (PCBs) using EPA Method 8082 and other fuel additives and blending compounds.

If field screening indicates volatile organic compound (VOC) concentrations greater than 10 parts per million (ppm) as measured with a calibrated photoionization detector (PID), then the soil sample shall also be analyzed for VOCs using EPA method 8260. An XRF machine also can be used to field-screen soil for metals.

After review of the chemical analytical data, the soil represented by the boring shall be categorized into one of the three soil categories described in Section 7.0.

7.0 SOIL CATEGORIES AND DEFINITIONS

Three soil handling categories were developed to guide the City and contractor during major soil excavation activities. The following section (Section 8.0) discusses the specific soil excavation and handling protocols for each soil category. Use of these categories and protocols is predicated on subsurface soil within each project area being adequately characterized and extents of each soil category sufficiently delineated.

7.1. Contaminated Soil

For the purposes of soil handling for the Redevelopment Project, soil is considered "contaminated" if:

- Contaminant concentrations for any analyte exceed MTCA Method A for Unrestricted Land Use cleanup criteria;
- Contaminant concentrations meet or exceed dangerous waste and dangerous waste source criteria as defined in Washington Administrative Code (WAC) 173-303;
- TCLP results exceed RCRA regulatory levels; or
- Physical evidence of contamination (sheen, odor, staining) is observed, unless additional chemical analysis is performed to further categorize the soil.

7.2. Impacted Soil

Soil is considered "impacted" if:

- Contaminant concentrations for any analyte exceed laboratory reporting limits but are **less** than the respective MTCA Method A Cleanup Criteria for Unrestricted Land Use.

7.3. Clean Soil

Soil is considered "clean" if:

- Contaminants are not detected for any analyte at concentrations that exceed the respective method reporting limit; and
- Physical evidence of contamination (sheen, odor or staining) is **not** observed.

Method reporting limits for non-detected COCs must be less than applicable MTCA Method A cleanup levels for unrestricted land use for soil to be considered "clean".

8.0 SOIL EXCAVATION AND HANDLING RECOMMENDATIONS

Each soil category requires special handling and reuse procedures. The following sections provide additional information on handling each soil category. A flow chart is provided on Figure 3 to assist with categorizing soil and determining suitable uses and restrictions.

When excavation activities in Contaminated Soil or Impacted Soil are finished, characterization soil samples representative of soil left in place shall be collected by the environmental professional. Soil left in place includes soil under structures and soil remaining in-place after excavations. Characterization soil samples shall be submitted for chemical analysis in accordance with the test methods described in Section 6.0 or as appropriate, based on previous project testing results.

Specific on-site repositories for Contaminated Soil or Impacted Soil may be designated through the park redevelopment. On-site repository design, construction and acceptable soils shall be coordinated with appropriate regulatory authorities including Ecology, the Washington State Department of Health (DOH), and the Spokane Regional Health District.

8.1. Contaminated Soil

Contaminated Soil includes Dangerous Waste or soil where COC concentrations were detected at concentrations **greater** than the MTCA Method A for Unrestricted Land Use cleanup criteria. Special handling and end use considerations are needed for soil categorized as contaminated. Special handling and disposal shall include the following:

- **Soil Excavation and Segregation:** The City's environmental consultant shall be on-call and on-site during applicable excavation of Contaminated Soil to field screen soil and collect characterization soil samples as needed. Field screening methods are described in Appendix A. The Contractor shall segregate Contaminated Soil from the other soil categories to prevent mingling of Contaminated Soil with other soil categories. Characterization soil samples shall be collected at the end of the excavation to represent soil left in place.
- **Loading/Transportation/Stockpiling:** Soil categorized as Dangerous Waste or Contaminated Soil can either be loaded directly into trucks and transported for off-site permitted disposal, or can be temporarily stockpiled on plastic sheeting (Visqueen) on the subject property, pending disposal or evaluation for reuse. Stockpiles shall be surrounded by sand bags and covered with plastic sheeting to minimize contaminant-impacted runoff and wind-blown dust. The sand bags shall reduce the potential for stormwater run on to, or leachate flow from the stockpiles; additionally, the sand bags may be used to anchor the plastic sheeting. Additional soil handling requirements might be provided in the approved erosion and sediment control plan.

  Contaminated Soil may be screened on site to separate grain sizes greater than 1-inch-diameter from finer material. Material greater than 1-inch-diameter may be combined with Impacted Soil for on-site reuse or disposed of as Clean Soil. The Contractor shall develop and maintain a procedure to track Contaminated Soil loads transported off site for permitted disposal. The contractor shall develop and maintain dust suppression and wash water handling procedures for screening operations.
- **Acceptable Uses of Contaminated Soil**: The acceptable use of contaminated soil depends on the COCs and the concentrations.
  - Dangerous Waste shall be disposed of off-site at an approved landfill.

- Contaminated Soil not tested for VOCs or with VOCs less than reporting limits may be suitable for use under buildings, structures and roads if soil engineering properties meet geotechnical requirements for the proposed application. If soil is contaminated with VOCs at concentrations greater than MTCA Method A for Unrestricted Land Use cleanup criteria, the soil shall be disposed of off-site or an approved on-site repository. If Contaminated Soil has VOCs greater than reporting limits, but less than MTCA Method A for Unrestricted Land Use, the soil can be used in open areas under roads or walkways, but not within 20 feet of buildings and structures where vapors could accumulate within enclosed areas. Contaminated Soil identified for reuse shall be placed above the mean high groundwater table level (or above river level for the south bank) and more than 12 inches below surface grade. If soil is not covered by an impermeable surface, such as buildings or pavement, a geotextile bio-barrier shall be installed over the Contaminated Soil to separate it from clean fill placed above. Stormwater infiltration shall not be directed towards areas of Contaminated Soil left in place.

- **Disposal/Recycling Facilities:** Contaminated Soil can be transported to the selected disposal facility after approval is granted by the facility. Additional chemical analysis might be required by the disposal facility before material acceptance. Potential disposal/recycling facilities include the following:
  - Waste Management's Graham Road Landfill in Medical Lake, Washington.
  - Waste Management's Columbia Ridge Landfill in Arlington, Oregon for disposal of Dangerous Waste.
  - Approved on-site repository.

8.2. Impacted Soil

Impacted Soil is defined as soil with COCs concentrations **greater** than laboratory reporting limits, but **less** than MTCA Method A Unrestricted Land Use cleanup criteria. Special handling and end use considerations are needed for impacted soil. Special handling and disposal shall include the following:

- **Soil Excavation and Segregation**: The City's environmental consultant shall be on-call and on-site during applicable excavation of Impacted Soil to field screen soil and collect characterization soil samples as needed. The Contractor shall segregate Impacted Soil from soil of other categories to prevent co-mingling of soil types. Characterization soil samples shall be collected at the limits of excavations to represent soil left in place.
- **Loading/Transportation/Stockpiling:** Impacted Soil can either be loaded directly into trucks or temporarily stockpiled on plastic sheeting (Visqueen) on the subject property or other designated areas. Stockpiles shall be surrounded by sand bags and covered with plastic sheeting to minimize contaminant-impacted runoff and wind-blown dust. The sand bags shall reduce the potential for stormwater run on to, or leachate flow from the stockpiles; additionally, the sand bags may be used to anchor the plastic sheeting. Additional soil handling requirements might be provided in the approved erosion and sediment control plan.
- **Acceptable Uses of Impacted Soil**: Impacted Soil not tested for VOCs or with VOCs less than laboratory reporting limits might be suitable for use under buildings, structures, roads, under landscape areas and within electrical and non-potable water utility corridors if soil engineering properties meet geotechnical requirements for the proposed application. If Impacted Soil has VOCs greater than

reporting limits, the soil can be used in open areas under roads or walkways, but not within 20 feet of buildings and structures where vapors could accumulate in enclosed areas.

Impacted Soil shall be placed above the mean high groundwater table level (or above river level for the south bank) and more than 6 inches below surface grade. Stormwater infiltration shall not be directed towards areas of Impacted Soil left in place.

- **Disposal/Recycling Facilities:** Impacted Soil can be transported to a selected disposal facility after approval is granted by the facility, if needed. Additional chemical analysis might be required by the disposal facility before material acceptance.

8.3. Clean Soil

Clean soil includes soil where COCs are not detected or COC concentrations were detected at concentrations that represent background conditions. There are no special handling or end-use requirements for this soil. Characterization soil samples shall be collected at the limits of excavations to represent soil left in place.

8.4. Equipment

Excavation equipment used to handle contaminated soil and vehicles driven over on-site fill shall be decontaminated using a high-pressure/low-flow wash at a dedicated vehicle wash area before exiting the site. Decontamination water shall be contained onsite, sampled for the contaminants of concern (PAHs and metals), profiled and appropriately disposed. Decontamination water collected from the vehicle wash shall only be released to the municipal storm or sanitary sewers if applicable permits and approvals are obtained from Ecology and/or the City of Spokane Wastewater Management Department, as applicable. The contractor shall dedicate specific excavation equipment for handling on-site contaminated fill to reduce the required decontamination efforts and minimize decontamination water generated. Trucks used to transport contaminated soil offsite, shall be covered with tarps to minimize wind-blown loss of contaminated materials over the haul route.

8.5. Dust Control

The contractor shall minimize fugitive dust generated from on-site fill by actively suppressing dust. Dust control can include but is not limited to:

- Clearing only those areas where immediate activity will take place while maintaining original ground cover as long as practical.
- Spraying exposed surfaces with water or other suitable palliative and repeating as necessary throughout the course of construction. Water applied as dust control shall not leave the site as surface runoff.

9.0 DISCOVERY OF UNEXPECTED POTENTIALLY CONTAMINATED/IMPACTED SOIL OR USTS

The City's environmental consultant shall be on-call and available to perform field screening and characterization sampling as needed during construction activities. However; during construction activities, it is the City's or Contractor's responsibility to identify potentially contaminated/impacted soil as described below, and to notify the City and the City's environmental consultant immediately after the discovery.

Additionally, historic site uses indicate undocumented USTs may be encountered during construction activities at the subject property. It is the Contractor's responsibility to stop all work near the UST and notify the City and the City's environmental consultant immediately upon discovery.

9.1. Unexpected Potentially Contaminated or Impacted Soil

Excavated soil from a location shall be considered to be petroleum-contaminated/impacted if it exhibits one or more of the following physical characteristics:

- Staining;
- Petroleum hydrocarbon or other odors associated with VOCs;
- A moderate or heavy sheen when placed in contact with water; and/or
- Significant concentrations of organic vapors detected using headspace field screening methods.

If soil exhibiting one or more of the above characteristics is discovered that has not been previously identified and categorized, the Contractor shall notify the City immediately for characterization prior to removal and/or disposal. A "Potentially Contaminant-Impacted Soil Notification Form" is presented in Appendix B. Upon discovery of potentially contaminated/impacted soil, the Contractor shall refer to this guide for contact information of people to notify as well as information regarding the location, type and actions taken to address the potentially contaminated soil.

9.2. Undocumented UST Discovery

As described in Section 2.0 above, based on the results of our Phase I ESA, several USTs have been previously in use at the subject property, some of which might remain in-place. Additional undocumented USTs could be present beneath the subject property.

USTs encountered during construction shall be removed in accordance with the "Underground Storage Tank Regulations" ([WAC 173-360) and Ecology "Guidance for Site Checks and Site Assessments for Underground Storage Tanks" dated April 2003. A Washington State Site Assessment certified representative shall be present on the subject property during the removal of the USTs.

If a UST is discovered, the Contractor shall stop work near the UST and notify the City immediately. The Contractor also shall immediately notify Ecology and the Fire Marshall. Characterization of contents and the surrounding soil shall be performed prior to removal and/or disposal using the "Potentially Contaminant-Impacted Soil Notification Form" in Appendix B. Upon discovery of a UST and associated potentially contaminated/impacted soil adjacent to, or in the vicinity of the UST, the Contractor shall refer to this guide for contact information of people to notify as well as information regarding the actions taken to address the discovery.

If discovery of a previously unknown UST results in a release, first take steps to ensure the safety of workers at the site. The Contractor shall stop work near the UST and notify the City immediately. If safe to do so, take appropriate steps to contain the release including pumping out fluids to a different container and excavating soil where the release occurred. The City shall call environmental consultant and a licensed UST removal contractor. A tank removal and site characterization plan should be developed for the response.

10.0 CONTACT INFORMATION

If unexpected potentially contaminated soil, undocumented USTs or potentially contaminated groundwater is discovered during construction activities, the Contractor shall notify the City. As stated previously, in the event an undocumented UST is discovered, Ecology and the Fire Marshall also shall be immediately notified. Table 3 provides contact information for the program manager during construction and the Assistant Director of Park Operations at Riverfront Park for regular operation and maintenance.

TABLE 3. RELEVANT PROJECT CONTACTS

Name	Title	Phone	Email
City of Spokane Parks and Recreation – Construction Phase			
Berry Ellison	Program Manager	Office: 509.625.6276 Cell: 509.944.9932	bellison@spokanecity.org
Harvey Morrison	Construction Manager	509.981.9945	hmorrisoncm@gmail.com
City of Spokane Parks and Recreation – Riverfront Park Maintenance and Operations			
Garrett Jones	Assistant Director of Park Operations	509.363.5462	gjones@spokanecity.org
Security	NA	509.994.1424	NA
Maintenance	NA	509.879.7335	NA
Spokane Fire Department			
Michael Miller	Fire Marshall	509.625.7040	mmiller@spokanecity.org
Ecology			
Patti Carter	Ecology Toxics Cleanup Program Site Manager	509.329.3522	Patti.carter@ecy.wa.gov

11.0 PARK MAINTENANCE

Regular maintenance is conducted as part of normal operations at Riverfront Park. Regular maintenance includes activities such as landscape planting, tree removal, sprinkler repair, subsurface utility replacement/repair and other ground-disturbing activities. Regular maintenance activities that result in soil disturbances shall be documented and reported to Ecology in an annual maintenance summary report. If planned maintenance activities require excavating into previously undisturbed areas or excavating soil below imported clean soil and geotextile barriers, Ecology shall be notified prior to the start of work if conditions allow. When conducting maintenance, existing caps and soil segregation infrastructure (i.e. geotextiles) shall be maintained. Maintenance activities shall be conducted in a manner to keep clean imported soil from mixing with remaining in place Contaminated or Impacted Soil. To assist Parks personnel with documenting and understanding areas of known contamination, a park-wide maintenance plan should be developed that depicts areas of known contamination. The plan should be in an electronic format such as a GIS-based platform that can be updated as additional information is gathered. The maintenance plan should be included as part of the environmental covenant. Appropriate precautions shall be made to maintain worker safety during maintenance activities. This includes training employees on potential contaminants, exposure pathways and potential effects. The importance of hygiene and using appropriate PPE when conducting maintenance activities shall also be included in the training.

Employee training shall include procedures to prevent contaminant migration and mixing during maintenance activities. This includes erosion and sediment control measures to prevent Contaminated or Impacted Soil from entering the Spokane River, storm sewer systems or locations where the public could directly contact the soil.

Soil excavated as part of maintenance activities should be reused on-site in accordance with this plan, near the area it was removed from if possible. If off-site disposal is required, the soil should be tested in accordance with this soil management plan and disposed of in accordance with local, state and federal regulations.

12.0 LIMITATIONS

We have prepared this report for the exclusive use of the City of Spokane and their authorized agents. 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, shall 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.

Please refer to Appendix C, titled "Report Limitations and Guidelines for Use," for additional information pertaining to use of this report.

13.0 REFERENCES

GeoEngineers, Inc. 2014. "Phase I Environmental Site Assessment, Riverfront Park, 610 West Spokane Falls Boulevard." GEI File No. 0110-148-00. October 07.

Washington State Department of Ecology. 2013. "Model Toxics Control Act Regulation and Statute." Compiled by Washington State Department of Ecology, Toxics Cleanup Program, Publication No. 94-06. Revised 2013.

FIGURES

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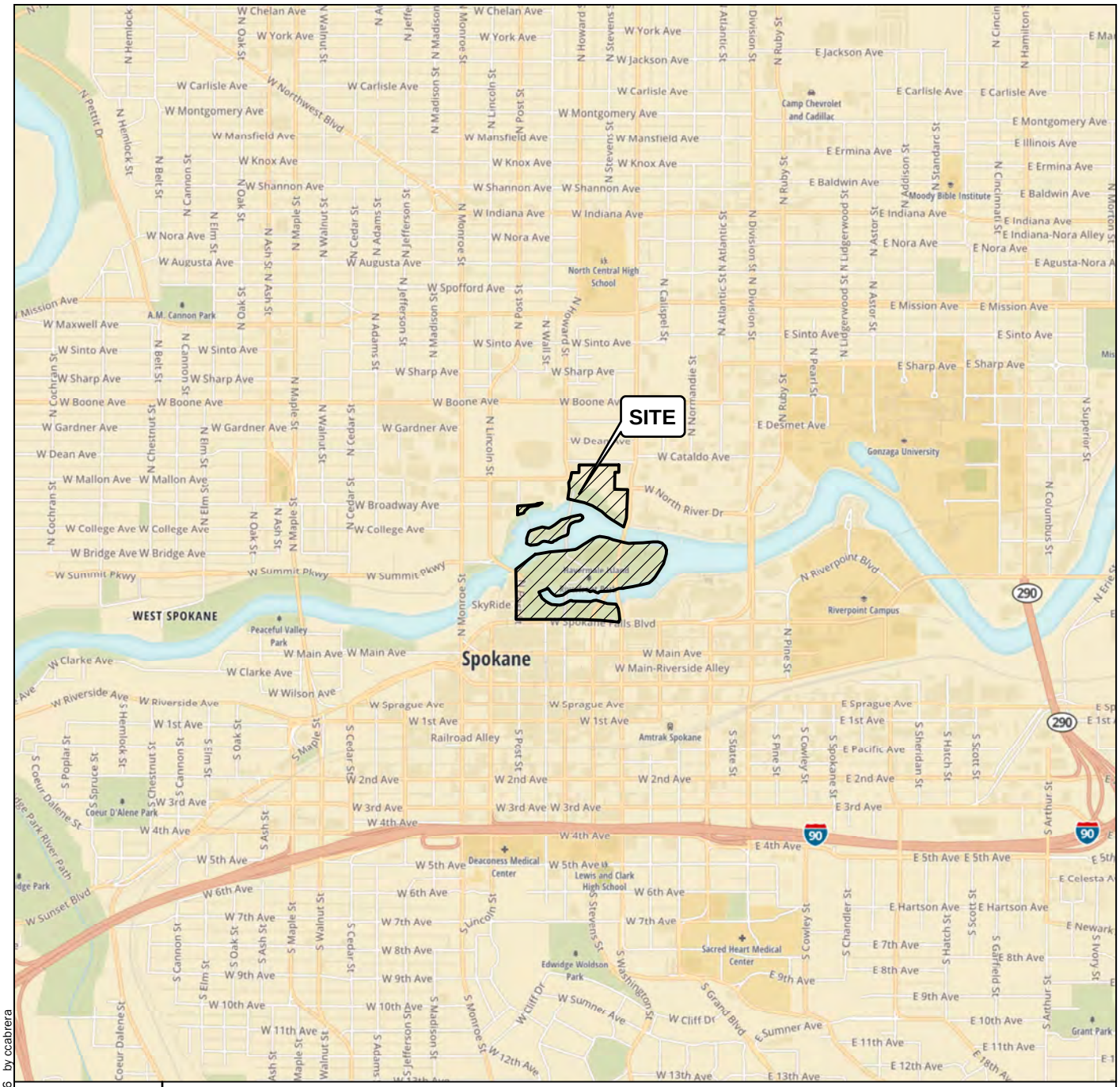

Legend

Site Boundary

N
W E
S

2,000 0 2,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 11N

Vicinity Map

Riverfront Park Soil Management Plan
Spokane, Washington

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Figure 1

P:\0\0110148\GIS\04\MXD\01101480 4_F1_VM.mxd Date Exported: 05/05/16 by ccabrera

Map Revised: 05 May 2016 ccabrera

Path: P:\0\0110148\GIS\04\MXD\011014800_F2_SP_SMP.mxd

Office: PORT

Data Source: Streets from City of Spokane GIS.

Approximate Site Boundary

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Projection: NAD 1983 UTM Zone 11N

N W E S

300 0 300
Feet

Site Plan

Riverfront Park Soil Management Plan
Spokane, Washington

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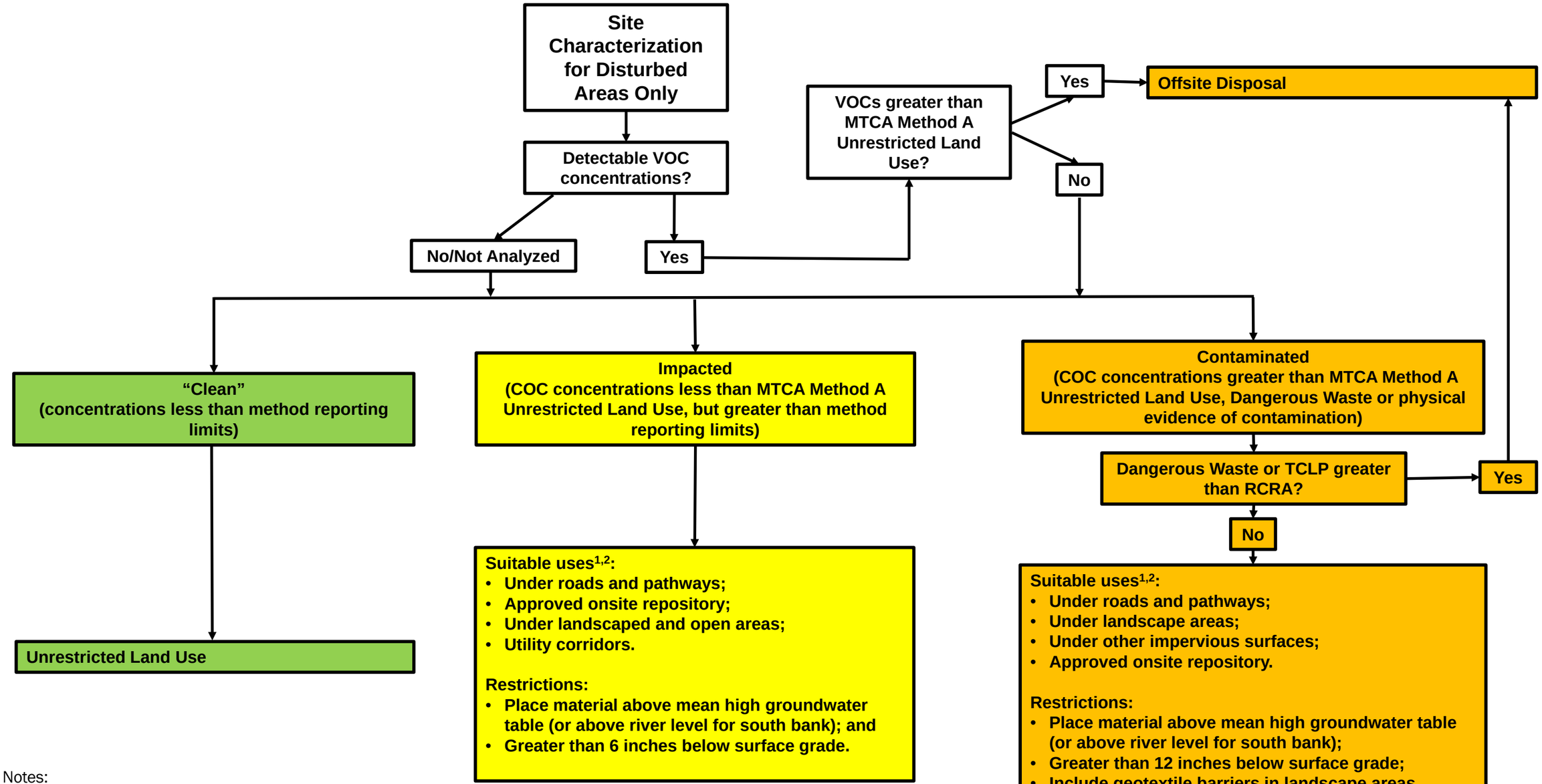
Figure 2



Notes:

1. If VOCs are less than laboratory reporting limits the soil can be used under buildings or structures if soil properties meet geotechnical requirements.
2. If VOCs are greater than laboratory reporting limits, but less than MTCA Method A for Unrestricted Land Use, the soil can be used in open areas under roads and pathways, but not within 20 feet of buildings and structures where vapors could accumulate within enclosed areas if soil properties meet geotechnical requirements.

MTCA - Washington State Department of Ecology Model Toxics Control Act.
VOCs – Volatile Organic Compounds
PAHs – Polycyclic Aromatic Hydrocarbons
COCs – Contaminants of Concern
RCRA – Resource Conservation and Recovery Act
TCLP – Toxicity Characteristic and Leaching Procedure

Acceptable Soil Uses

Riverfront Park Soil Management Plan
Spokane, Washington

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Figure 3

File No. 0110-148-04 5/6/16

APPENDICES

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APPENDIX A
Field Procedures

APPENDIX A
FIELD PROCEDURES

Field Screening of Soil Samples

Soil samples obtained from explorations shall be evaluated for evidence of possible contamination using field screening techniques. Field screening results can be used as a general guideline to delineate areas of possible petroleum- or VOC-related contamination in soil. In addition, screening results are often used as a basis for selecting soil samples for chemical analysis. The screening methods employed shall include: (1) visual examination, (2) water sheen testing, and (3) headspace vapor testing using a photoionization detector (PID).

Visual screening consists of observing the soil for stains indicative of petroleum-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Sheen screening is a more sensitive screening method that can be effective in detecting petroleum-based products.

Water sheen testing involves placing soil in water and observing the water surface for signs of sheen. Sheens are classified as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly.
Moderate Sheen (MS)	Light to heavy sheen, may have some color/iridescence; spread is irregular to flowing; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Headspace vapor screening involves placing a soil sample in a plastic bag. Air is captured in the bag, and the bag is shaken to expose the soil to the air trapped in the bag. The probe of the PID is inserted into the bag. The PID measures the concentration of photoionizable gases and vapors in the sample bag headspace. The PID is designed to quantify photoionizable gases and vapors up to 2,000 ppm, and is calibrated with isobutylene. A lower threshold of significance of 1 ppm is used in application.

Field screening results are site- and exploration- specific. The results may vary with temperature, moisture content, soil lithology, organic content and type of contaminant.

APPENDIX B
Potentially Contaminant-Impacted Soil Notification Form

RIVERFRONT PARK REDEVELOPMENT
POTENTIALLY CONTAMINANT IMPACTED SOIL NOTIFICATION FORM

Prepared for:	**GENERAL INFORMATION**	
City of Spokane Department of Parks and Recreation 808 West Spokane Falls Boulevard, 5th Floor Spokane, Washington 99201	DATE OF DISCOVERY:	TIME OF DISCOVERY:
	PERSON DISCOVERING CONDITION:	PHONE NUMBER:
Prepared by: GeoEngineers 523 East Second Avenue Spokane, WA 99202 509.363.3125	PERSON FILLING OUT FORM:	PHONE NUMBER:
	APPROXIMATE LOCATION OF SOIL ON THE SITE:	

SOIL CHARACTERISTICS

PHYSICAL CHARACTERISTICS:	**SOIL DISTURBED:**	**FREE LIQUIDS:**
Odor: ☐ Yes (Describe_____) ☐ No Staining: ☐ Yes (Describe_____) ☐ No Other: _____ _____	☐ Soil in-place ☐ Soil stockpiled	☐ Yes (Content_____%) ☐ No
	ACTIONS TAKEN: _____ _____ _____ _____ _____	**ESTIMATED VOLUME OF CONTAMINATED SOIL:**

NOTIFICATION CONTACT INFORMATION

City of Spokane	**Environmental Professional**	**Contractor**
Berry Ellison 509.625.6276 bellison@spokanecity.org		

ADDITIONAL INFORMATION

This record serves to document information, actions, and notifications regarding the discovery of and response to the presence of suspected and known contamination on the project.

APPENDIX C
Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This Appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of City of Spokane Parks and Recreation (Parks), their authorized agents and regulatory agencies. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment or remedial action study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Parks should rely on this plan without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report Is Based on a Unique Set of Project-Specific Factors

This report applies to the Riverfront Redevelopment Project in Spokane, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this remedial action plan, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

Reliance Conditions for Third Parties

No third party may rely on the product of our services unless GeoEngineers agrees in advance, and in writing to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Environmental Regulations Are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Uncertainty May Remain after Completion of Remedial Activities

Remediation activity completed in a portion of a site cannot wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

Subsurface Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Soil and Groundwater End Use

The cleanup criteria referenced in this report are site- and situation-specific. The cleanup criteria may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater). Note that hazardous substances may be present in some of the site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup criteria. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject site or reuse of the affected media on site to evaluate the potential for associated environmental liabilities. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject site to another location or its reuse on site in instances that we were not aware of or could not control.

Most Environmental Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical, Geologic and Geoenvironmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If the client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

Have we delivered World Class Client Service?

Please let us know by visiting **www.geoengineers.com/feedback**.

GeoEngineers