2014 CORRECTIVE ACTION REPORT
CITY OF TANANA NEW BUILDING EXCAVATION
FORMER TANANA POWER COMPANY SITE
TANANA, ALASKA

May 2015

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Excellence. Innovation. Service. Value.

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Submitted To:
Alaska Department of Environmental Conservation
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Anchorage, Alaska 99501

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HAZARD ID 3946
ADEC File Numbers 780.57.003 and 780.38.014

May 2015

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ACRONYMS AND ABBREVIATIONS

ºC	degree centigrade
ºF	degree Fahrenheit
ADEC	Alaska Department of Environmental Conservation
AES	Amundsen Environmental Services
bgs	below the ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
City	City of Tanana
COC	chain of custody
COPC	contaminant of potential concern
CRE	cumulative risk evaluation
CSM	conceptual site model
cy	cubic yards
DRO	diesel range organics
EPA	United States Environmental Protection Agency
FT	Field Technician
GRO	gasoline range organics
IC	institutional control
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
MTG	migration to groundwater
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
ppm	parts per million
QA	quality assurance
QC	quality control
RPD	relative percent difference
RRO	residual range organics
RSE	Restoration Science & Engineering
SCL	ADEC soil-cleanup level

SGS	SGS North America, Inc.
Site	Former Tanana Power Company Site
START	Superfund Technical Assistance and Response Team
TPC	Tanana Power Company
VI	vapor intrusion
VOCs	volatile organic compounds

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1.0 INTRODUCTION

Shannon & Wilson, Inc. prepared this report on our field-screening and soil-sampling activities during additional excavation at the Former Tanana Power Site in Tanana, Alaska. This report was prepared for the Alaska Department of Environmental Conservation (ADEC), under our Hazardous Substance Spill Prevention and Cleanup Term Contract 18-8036-03, Notice to Proceed 18803603007D. This contract amendment is a follow-up to original excavation work performed in 2013, when 2,300 cubic yards (cy) of contaminated soil was removed from the Former Tanana Power Company Site (the Site). This report describes only 2014 remediation activities; refer to our April 2014 *Corrective Action Report* for a summary of 2013 activities.

1.1 Project Description and Objectives

In 2013, the ADEC used the Reuse and Redevelopment (Brownfield) Program to assist the City of Tanana (City) in a redevelopment project at the Former Tanana Power Company Site (Lot 8, Block 10, Townsite of Tanana). The City plans to construct two buildings on this property: a (multi-purpose community services facility to replace the current Town Hall and a housing facility). In 2013, ADEC contracted with Shannon & Wilson to work with the City to excavate and treat petroleum-contaminated soil from areas proposed for redevelopment. The City excavated soil from two proposed building locations and constructed an off-site landfarm for contaminated-soil treatment; Shannon & Wilson's role was to field-screen excavated soil, and collect soil samples at the limits of the excavations and other locations. The analytical results of soil sampling indicated petroleum-contaminated soil exceeding ADEC soil-cleanup levels remained at the base and sidewalls in both excavations.

The objective of the 2013 assessment was to excavate soil to predefined limits in the footprint of two proposed building locations to support redevelopment plans. The objective of the continuing activities in 2014 was to remove an estimated, 500 cy of (additional) petroleum-contaminated soil exceeding ADEC soil-cleanup levels from the two existing excavations.

1.2 Scope of Services

The scope of services included modifying the 2013 *Work Plan* and landfarm plan, providing guidance and observation of contaminated-soil removal during excavation, collecting verification soil samples for laboratory analysis, and preparing a detailed summary report. The City provided

equipment and personnel to excavate and handle the soil and enlarge the landfarm cell to treat the contaminated soil, and is responsible for managing the landfarmed soil. This report includes analytical laboratory results, conclusions, and recommendations relevant to vapor-intrusion mitigation and other remediation efforts.

Shannon & Wilson's primary task was to field-screen excavated soils associated with additional excavation for two new buildings the City plans to build on the subject site. We used our field-screening results to determine whether petroleum hydrocarbon-contamination was present in excavated soil and at the limits of excavation, and to provide guidance for handling potentially contaminated soils.

We field-classified soil based on photoionization-detector (PID) field-screening results. Observation of soil staining and/or PID readings of 20 parts per million (ppm) or greater were considered indicative of potential petroleum hydrocarbon soil contamination exceeding ADEC soil-cleanup levels (SCLs). We considered soil with a PID reading less than 20 ppm to be clean, i.e., not exceeding SCLs. Field-classified contaminated soil was transported off-site to a designated area at the City landfill for treatment by landfarming.

We collected headspace samples for field screening at a minimum rate of one sample per 10 cy of excavated soil. We collected analytical samples from stockpiled clean and contaminated landfarmed soil to determine the concentrations of contaminants prior to landfarming or reuse of the soil. We also collected analytical samples to characterize the landfarm area prior to use and the limits of excavation. We submitted the samples for analysis of gasoline range organics (GRO); diesel range organics (DRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and polynuclear aromatic hydrocarbons (PAHs).

2.0 BACKGROUND

This section presents information on the location and setting, the community of Tanana, resources and existing infrastructure, and proposed redevelopment plans for the Site.

2.1 Community Overview

2.1.1 Location, Climate, and Geologic Setting

Tanana is a small community in Interior Alaska, located approximately 130 air miles west of Fairbanks on the Yukon River (Figure 1, Vicinity Map). The City is two miles west of the confluence of the Tanana and Yukon Rivers, and is accessible year-round by air or seasonally by river. The river is generally ice-free from mid-May through mid-October.

The City encompasses 11.6 square miles of land along the northern riverbank of the Yukon, which flows locally east to west and regionally northeast to southwest. The Tanana Power Company (TPC) property (Lot 8, Block 10) is a cleared lot located near the eastern edge of the City (Figure 1). The southern property boundary is 100 feet from the bank of the Yukon River.

Tanana average daily temperatures range seasonally between a maximum of 64 °F (degrees Fahrenheit) to 70 °F in the summer and a minimum of -14 °F to -48 °F in the winter. Average annual precipitation is 13 inches, much of which falls as snowfall (50 inches).

Tanana lies within the Intermountain Plateau of Interior Alaska, at the junction of the Kokrine-Hodzana Highland physiographic province to the north of the Yukon River and Nowitna Lowland province to the south. To the north, repeated ridges of 2,000 to 4,000 feet elevation are punctuated by isolated peaks up to 5,700 feet high. Ridges and mountains comprise primarily schist and gneiss that form northeast-trending structures, and occasional granitic intrusions. The region is drained by a number of Yukon River tributaries, and there are few lakes. Near the Yukon River, surface soils and sediments are dominated by alluvial deposits. To the south, the former Yukon River floodplain exhibits gradual slopes and local relief of less than 250 feet. The predominant material near major rivers is alluvial silt, with sand dunes and windblown silt deposits further to the south. Oxbow lakes and meander scars are common in the northern and eastern portions of the province, near the Yukon and Tanana Rivers.

Both provinces are underlain by discontinuous permafrost, with the exception of recently abandoned flood plains. Permafrost is defined as ground that has remained at a temperature of 32 °F or less for two or more years. The thickness of the “active layer,” the portion of the ground at or near the surface that undergoes an annual freeze-thaw cycle, is largely dependent upon the type of ground cover and snow depth, but also includes other factors. Seasonal frost penetration commonly exceeds 10 feet beneath roads or parking areas kept free of snow during winter.

The 2009 *Site Characterization Report* for the subject site prepared by Amundsen Environmental Services (AES) includes a cross-section of Tanana, near the Yukon River. In unfilled areas, the first 1 to 5 feet below the ground surface (bgs) are composed of organic material and/or organic-rich sediments. This unit is underlain by 2 to 10 feet of silt, which is frozen at more than about 80 feet from the Yukon River. Beneath the silt lies a 30- to 65-foot-thick unit of water-bearing sand and gravel, which is frozen at depths greater than 15 to 20 feet bgs near the river. More than about 40 feet from the Yukon River, the entire unit is frozen. Beneath the sand and gravel lie sandstone and claystone for the first 40 to 50 feet from the river, and schist at greater distances from the river. Depth to groundwater within approximately 80 feet of the riverbank varies between 10 and 16 feet bgs.

2.1.2 Community Demographic Data

Tanana has a population of 238, according to a 2013 estimate by the Alaska Department of Commerce, Community, and Economic Development. According to the 2010 U.S. Census, 87 percent of residents are Alaska Native or part Native while 11 percent are Caucasian or part Caucasian. Less than 1 percent of residents are of other races. The population at the time of the 2010 Census was considered 53 percent male and 47 percent female, with a median age of 33 years. Approximately 30 percent of residents are under the age of 20, 20 percent between the ages of 20 and 40, 42 percent between the ages of 40 and 65, and 8 percent over the age of 65.

The 2010 Census identified 100 total occupied housing units and 57 households with an average household size of three. The median household income in Tanana is $45,180 +/- $18,420, and per capita income is $21,130 +/- $5,210. Based on the U.S. Census Bureau's 2008-2012 American Community Survey 5-Year Estimates, 12.7 percent of the population lives in poverty.

The 2000 Census found that 60.2 percent of residents were employed, with an unemployment rate of 23.7 percent. However, 52.4 percent of adults were not considered part of the work force. Two thirds of full-time employment in 2000 was with the City, school district, or Tanana Tribal Council. The U.S. Bureau of Land Management is an important seasonal employer. The Maudrey Sommer School (Kindergarten through 12th grade) employs five teachers and serves 40 students.

Many traditional Athabascan practices persist in Tanana, including dances, foot races, potlatches, and subsistence hunting and fishing. Some community members speak Koyukon as their primary language. Subsistence foods include salmon, whitefish, moose, bear, ptarmigan, waterfowl, and berries. There are also ten commercial fishing permit holders.

2.1.3 Community Resources and Infrastructure

This section summarizes existing and planned community infrastructure projects, including utilities (water, electricity, fuel, solid waste disposal, and telephone) and transportation (roads, airports, waterways).

2.1.3.1 Public Water Supply

The City's water supply is administered by Too-gha, Incorporated, a non-profit utility board (Public Water System ID #AK2360109). Too-gha, Inc. operates a single well on Park Avenue, which according to the State of Alaska Well Log Tracking System was completed prior to 1988 and has a 5,000 gallon-per-day capacity. The ADEC Division of Water categorizes the Tanana Safewater Facility Water Treatment System as a Class 2 system, with a rating of 44 out of 100. The water treatment system has a peak day design capacity of 10,000 to 50,000 gallons per day.

The Tanana City Drinking Water Well is included in the ADEC Contaminated Sites Database as an informational entry (File No. 780.38.004). Beginning in 1992, benzene was detected in the well above the ADEC GW cleanup level. In addition to benzene, antimony and residual range organics (RRO) were also detected near or above cleanup levels in 2001. There have been detections of benzene and other analytes in recent sampling events, including 2010, 2012, and 2014. According to the ADEC database the extent and source of contamination are unknown but numerous sites are suspected.

In 2009, the ADEC received approval to prepare an environmental management plan for Tanana, in order to evaluate environmental concerns which could be affecting drinking water. The report by SLR International Corporation identifies a number of suspected sites near the City's water source. The groundwater source of the City's water supply is no longer considered affected.

Underground water and sewer lines are present along major roadways in the central town area, though the area served by sewer is more extensive than the area served by water. The Alaska Department of Commerce, Community and Economic Development (DCCED), Division of Community and Regional Affairs Community Profile Map was updated in 2009. According to this map, water and sewer lines are present along Hill Street and Second Avenue, along the western and northern property boundaries of Lot 8.

2.1.3.2 Electricity and Fuel

The Tanana Power Company, Inc, (TPC) runs a diesel power plant that serves the community of Tanana. It is a private electrical utility, serving 104 homes and 35 commercial businesses. In June 2013, residential rates were $0.76 per kilowatt-hour (kWh), or $0.30 per kWh after reimbursement under the Alaska Energy Authority's Power Cost Equalization program.

According to the 2009 Division of Community and Regional Affairs Community Profile Map, power lines are present along Second Avenue. Overhead power lines were observed during the site visit, and are present on the south side of Second Avenue along the northern property boundary of Lot 8. Heating oil for residential and commercial properties in Tanana is generally stored in aboveground heating oil tanks. Fuel is supplied by the local native corporation Tozitna, Limited, which maintains a distribution facility on First Avenue.

2.1.3.3 Solid Waste

The Tanana Landfill is operated by the City and is located over one mile west of town and approximately three miles from the subject property. The ADEC Solid Waste Program categorizes the landfill as Class III active, and current authorization expires in 2017 (ADEC Landfill Permit #SW3A063-17). The landfill is fenced, uses an incinerator, and provides basic recycling services. According to the ADEC Spills List, the landfill incinerator has occasionally been used to dispose of petroleum products such as spilled heating oil or diesel fuel.

Adjacent to the Tanana Landfill is a landfarm for contaminated soil from the subject property, which was constructed specifically for this purpose in 2013 and expanded in 2014. The 2013 landfarm is approximately 23,000 square feet in area surrounded by 4-foot-wide, 3-foot-high soil berms. The landfarm was expanded by approximately 8,000 square feet in August 2014 to accept additional soil excavated from the Site. Landfarm management includes aeration, surface-water drainage maintenance, and progress monitoring. Landfarming activities are coordinated by the City and are ongoing.

2.1.3.4 Telephone

Buried telephone lines are present throughout much of Tanana and are included in the 2009 DCCED, Division of Community and Regional Affairs Community Profile Map. Phone lines are buried along roadways and are present to the north of both First and Second Avenues. The nearest telephone line to the subject property is along the southern property line.

2.1.3.5 Roads and Transportation

The City maintains 32 miles of roads in and around the community, and operates a river dock for both private and commercial use. The State of Alaska owns and operates Ralph Calhoun Memorial Airport, which is served by six passenger and freight airlines and features a 4,400-foot by 100-foot gravel runway. Major roadways include Airport Road, Third Avenue, Second Avenue, and First Avenue/Front Street (AES, 2009). Additionally, the Yukon River is used seasonally by float planes.

Construction of a gravel road connecting Tanana and Manley Hot Springs, which will terminate on the south bank of the Yukon near the City, began in summer 2014. Completion of the road is projected for late 2015.

2.1.4 Proposed Community Development and Land Reuse

The City plans to construct two buildings on Lot 8: a multi-purpose community services facility and a housing facility. The current City Hall was constructed in the 1960's on a temporary foundation which reportedly poses ongoing structural problems. The proposed community-services facility will replace the City Hall and contain City, Tribe, and Tozitna, Limited offices, a conference room, and domestic-violence safe house. The planned housing facility will include independent living Elders apartments and health professional, teacher, and Village Public Safety Officer housing (DBAC Application, 2013).

The City has selected Lot 8 for these projects due to its central location and the proximity to water, sewer, electricity, and telephone lines. In November 2013 the City held a public hearing on the use of Community Development Block Grant funding. Attendees selected a senior housing complex and safe house as top priorities. In December 2013 a Community Development Block Grant Application was submitted for "Tanana Elders Independent Living Apartments" by Mr. Alfred Ketzler, City Manager. According to the Community Development Block Grant Office, the project was not funded.

2.2 Property Description

This section describes the location, history, and physical and geographic features of the Site.

2.2.1 Site Description and Features

The Site comprises Lot 8, Block 10 in the Townsite of Tanana and is at the southeast corner of Second Avenue and Hill Street in Tanana, Alaska (Figure 1). The Site is approximately 0.4 acres and is described as Lot 8, Block 10, US Survey 2754 A&B, Section 17, Township 4 North, Range 22 West, Fairbanks Meridian. Lot 8 is bounded by Hill Street to the west, Second Avenue to the north, Lot 7 to the east, and First Avenue and the Yukon River to the south.

The Site is currently vacant and partially vegetated. Site photographs taken in 2008 and 2012 show trees in the central and eastern portion of the property and brush and grasses on the remainder of the property. The 2009 Tanana Community Map aerial photography (June 17, 2009) also shows a shed near the middle of the eastern property line. It is not clear whether the shed is associated with the two residential structures to the east on Lot 7.

2.2.2 Physical Setting

The City encompasses 11.6 square miles of land along the northern bank of the Yukon River, which flows locally east to west and regionally northeast to southwest. The TPC property is a vacant lot located near the eastern edge of Tanana (Figure 1). The southern boundary of the Site is about 100 feet from the bank of the Yukon River. The property drains to the south and east, with an elevation change of two to three feet across the Site.

2.2.3 Groundwater

Based on our knowledge of local conditions, we expect groundwater at the Site flows to the west or southwest, roughly parallel to the flow of the Yukon River. Permafrost may impede groundwater movement in the vicinity of the Site.

This is consistent with the groundwater flow direction reported in a 2002 report prepared by Ridolfi Engineers, Inc. to document sites of potential environmental concern in Tanana. The Ridolfi document identifies groundwater flow towards the southwest at the Tanana Federal Aviation Administration Facility one mile west-northwest of the Site.

During a 2010 investigation on the property conducted by Amundsen Environmental Services groundwater infiltration was encountered in three test pits excavated below 21.5 feet bgs. According to the 2011 *Site Characterization Report*, a groundwater-bearing unit (sand and gravel, between 10 and 52 feet bgs) is frozen at a distance greater than approximately 80 lateral feet from the Yukon River.

2.2.4 Site Soils

Determining site-specific subsurface geology is outside the scope of this project. However, we were able to identify subsurface conditions in the vicinity of the Site, which are summarized in this section. Soil types observed during excavation in 2013 and 2014 are consistent those predicted by the 2009 *Tanana Power Site Characterization Report*, (AES) and with regional geology (Section 2.1.1, Location, Climate, and Geologic Setting). Field personnel observed moist brown silt with sand and trace organics at 0.5 feet bgs, and light brown to brown to gray silt to sandy silt, some with trace organics, at 1.5 to 8 feet bgs. Between 8 and 11 feet bgs, brown to gray gravel with sand was observed. Near the Yukon River, surface soils and sediments are dominated by alluvial deposits and the gravel may be a local lens.

2.2.5 Historical Site and Land Use

TPC operated a power-generation facility at this site from 1966 to 1983. Improvements included a diesel-fired power plant, two 500-gallon day tanks, a livery on the northern portion of the property, and a 75,000-gallon capacity tank farm on its southern part. A three-inch-diameter pipe

connected the day tanks to the tank farm. The power plant operated on this site until 1983, when it was moved to a site north of Third Avenue.

Site use between 1983 and present is unknown, and the property has remained vacant. According to the AES *Site Characterization Report II*, "industrial activity at the site ended in 1986. The powerhouse building was burned and all concrete and debris removed from the property in 2000" (AES, 2011). In the subsequent years, trees, shrubs, and grasses have regrown. Site photographs from 2008 and 2012 show that the property was mostly vegetated. A shed is present near the middle of the eastern property line in a 2009 aerial photograph, which may have been a temporary structure. This report notes the neighbor's encroachment on the subject property with automobiles, snow machines, and a garage/shed. The Brownfield Assessment or Cleanup Request Form describes no other site uses (DBAC Application, 2013).

A strong hydrocarbon odor and soil staining were encountered in 2005 during the excavation of a sewer trench along the northern property line. Characterization efforts began in 2008 when five soil test pits were excavated by AES. Large-scale building footprint excavation began in September 2013 (2,300 cubic yards) and continued in August 2014 (500 cubic yards).

2.2.6 Adjoining Property Use

The adjoining properties to the east, north, and west are residential; four homes are located within 100 feet of the subject property. The home to the east of the property is the closest; its west wall is within 20 feet of the property line. During a 2010 investigation, it was discovered that a hotel had been in the southern portion of the property to east from the early 1900's until the 1960's. "Then a house was built at the site, which was removed in the 1980's" (AES, 2011).

2.2.7 Ownership Information

Prior to 2013, the property owner was TPC. On December 13, 2013 ownership was conveyed from the TPC to the City. We researched the Alaska Department of Natural Resources Recorder's Office and Land Records database on January 19, 2015 and encountered no other records of property ownership for this site. In addition, the statutory warrantee deed indemnified TPC against past and future environmental liability.

2.3 Environmental Review and Summary

The Site has been the subject of several environmental assessments commissioned by TPC in 2008 and 2010. These assessments documented soil and groundwater contamination at the Site which was attributed to spills and releases from the fuel tanks and piping. Contaminants of potential concern were determined to be GRO, DRO, and BTEX.

2.3.1 2001 EPA START Investigation

In 2001, the Environmental Protection Agency (EPA) Superfund Technical Assessment and Response Team (START) conducted an area-wide investigation of several properties in Tanana, including Lot 8. The investigation was part of an attempt to identify the source of benzene detected in the public drinking water well. A soil sample collected at the former power plant location contained elevated levels of petroleum hydrocarbons and trace levels of pesticides (ADEC, 2012).

2.3.2 2005 Sewer Trench Sampling

In 2005, strong hydrocarbon odors and stained soil were observed by workers excavating a trench for the Tanana Sewer Upgrade Project along Second Avenue north of the Tanana Power Company property. Restoration Science & Engineering (RSE) was contracted by Too'gha Inc to perform a hazard assessment using air monitoring and soil sampling. RSE obtained information on a possible 1969 diesel spill associated with Lot 8 and the TCP. "RSE was informed by village residents that the spill may have included release of 30,000 gallons of diesel" (RSE, 2005).

Soil samples collected at about 13.5 feet bgs were analyzed for DRO, GRO, BTEX, RRO, metals, polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs). Benzene and PCBs were not detected. Toluene, ethylbenzene, and xylenes, and VOCs associated with diesel fuel were detected. The only contaminants exceeding ADEC soil-cleanup levels were DRO at concentrations up to 21,500 milligrams per kilogram (mg/kg), GRO at up to 415 mg/kg, and naphthalene at 25.2 mg/kg. Because this contamination was found in the right-of-way and is beneath the roadbed, further excavation was not performed. RSE concluded that the contamination observed in the excavation consists of diesel fuel (RSE, 2005). Although the source of this contamination is unclear, it is assumed to be associated with activities on the TCP property (ADEC, 2012).

2.3.3 2008 Site Characterization

In 2008, TPC hired AES to conduct additional site characterization as requested by ADEC. Five test pits were excavated to a maximum depth of 13.5 feet bgs; permafrost was encountered at a depth of 10 to 13.5 feet bgs. Hydrocarbon-contaminated soils were found from 2.5 to 13.5 feet bgs. Soil samples contained up to 8,910 mg/kg DRO, 497 mg/kg GRO, 0.081 mg/kg benzene, 6.67 mg/kg ethylbenzene, 14.3 mg/kg 1-methylnaphthalene, and 19.3 mg/kg 2-methylnaphthalene. Most detections above the ADEC soil-cleanup levels were in a sample from one test pit (AES, 2009). The northern portion of the Site was found "likely to be the most contaminated area" (AES, 2011).

2.3.4 2010 Site Characterization

AES conducted further site characterization in 2010 with the excavation of nine additional soil test pits to or below permafrost (present at 8-9 feet bgs), to a maximum depth of 24.5 feet bgs. Soil samples contained up to 751.l mg/kg DRO. Groundwater was observed in three test pits excavated below 21.5 feet bgs on the west side of the property. The samples at this depth are believed to have been collected below the elevation of the Yukon River. One groundwater sample collected from the bottom of a test pit at 24.5 feet bgs contained 18 milligrams per liter (mg/L) DRO (AES, 2011). The report concluded the water table observed in the test pit is directly connected to surface water.

Test pits on the eastern side of the property encountered permafrost beginning at 9 to 15 feet bgs. The investigation included a test pit 85 feet north of the northern boundary of Lot 8, which was excavated to more than 18 feet bgs. No groundwater or hydrocarbon odor was observed. A second off-site test pit was located west of the property and adjacent to Second Avenue and Hill Street; permafrost was observed at 8 feet bgs and no hydrocarbon odor was observed.

2.3.5 2012 Groundwater Sampling

During a meeting between ADEC and TCP in 2011, an alternate point of compliance for potential groundwater contamination was established at the edge of the Yukon River, in the assumed downgradient direction from the property. Fairbanks Environmental Services personnel sampled water from the groundwater/surface water interface in 2012 from three 3-4 foot deep temporary well points adjacent to the Yukon River and at the low stage of the river to capture groundwater flowing into the river. No contaminants (GRO, DRO, BTEX, PAHs) were detected in the samples (ADEC, 2012).

2.3.6 Institutional Controls

ADEC prepared *the Decision Document, Tanana Power Company, Cleanup Complete Determination - Institutional Controls* for this site in 2012, which indicated “Contamination remains on site above established default cleanup levels however ADEC has determined there is no unacceptable risk to human health or the environment. Therefore this site will be issued a ‘Cleanup Complete – Institutional Controls (ICs) determination’ subject to certain conditions.” One of those conditions was that future site development must be done in a manner that properly manages environmental concerns. This includes proper handling of contaminated soil generated by excavation activities and mitigating potential vapor intrusion into structures built on the property. The Decision Document identified the default soil-cleanup levels for this site as the 18 AAC 75.341, Method Two, Table B1 and B2, Under 40 inch Zone, Migration to Groundwater (MTG) cleanup levels.

The following conditions are specified in the ADEC Decision Document:

1. If land use and/or ownership changes, ADEC may require additional remediation and/or ICs. Therefore (the property owner) shall report to ADEC every three years to document land use or changes in land ownership.
2. A Notice of Environmental Contamination (deed notice) shall be recorded in the State Recorder's Office that identifies the nature and extent of contamination at the property and any conditions that the owners and operators are subject to in accordance with this decision document.
3. Installation of groundwater wells will require approval from ADEC.
4. Any proposal to excavate and transport soil or groundwater off site requires ADEC approval in accordance with 18 AAC 75.325 (i).
5. If and when the soil becomes accessible due to construction or excavation activities, the (contaminated) soil must be evaluated and contamination addressed in accordance with an ADEC-approved work plan.
6. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 Water Quality Standards is prohibited.

2.3.7 2013 Corrective Action

In September 2013, Shannon & Wilson assisted with corrective action involving excavating soils at the Site as part of the City's plans to build two new buildings. Our primary task was to field-segregate excavated soil as "clean," i.e. not exceeding ADEC SCLs, or "contaminated," i.e. exceeding ADEC SCLs. City personnel excavated a total of about 2,500 cy of soil from two separate excavations on the Site (Figure 2). Contaminated soil from the excavations was transported to a prepared area at the landfill for landfarming, and clean soils were stockpiled on site. The total volume of contaminated soil transported to the landfarm was about 2,300 cy. About 200 cy of clean soil was stockpiled adjacent to the excavation areas.

We collected samples from the base and sidewalls of excavations, from excavated soils placed at the landfarm site, and from the "clean" soil stockpiles. We submitted the soil samples to a laboratory for analytical testing for BTEX, DRO, GRO and PAHs. Laboratory results of the 2013 samples indicated GRO and DRO concentrations exceeded the ADEC SCLs in soil samples collected from the base and sidewalls of the first excavation area, and DRO concentrations exceeded the ADEC SCL in samples from the base and sidewalls of the second excavation area. DRO concentrations also exceeded the ADEC SCL in contaminated soil placed in the landfarm. In October 2013, City personnel partially backfilled the excavations with sandy gravel fill and we later tested the air with a PID and Draeger tubes for the presence of volatile compounds. Results of the air monitoring indicated that benzene was not present in the air.

Based on our 2013 observations and field and analytical results, we concluded:

- Native soil in the landfarm area, prior to contaminated-soil placement, did not exceed the ADEC MTG soil-cleanup levels.
- DRO concentrations exceeding 12,500 mg/kg remain in the excavation sidewall and base in the southern half of Excavation 1 (Figure 2).
- DRO concentrations exceeding 12,500 mg/kg remain in the excavation sidewalls and base in the northwest corner of Excavation 2 (Figure 2).
- All but two of the samples we collected from the 2,300 cy of soil placed in the landfarm exceed ADEC's Target Level for Disposal for DRO (2,000 mg/kg). We recommend the City follow the treatment recommendations we presented in our September 2013 *Contaminated Soil Landfarming Plan* to meet the ADEC Target Levels for beneficial reuse at the City of Tanana landfill.
- Vapor intrusion (VI) into future structures on the Site is a potential exposure pathway.

We recommended the City incorporate one or more passive measures into the design and construction of future structures at the Site to control the VI exposure pathway.

3.0 FIELD METHODS

Field activities were performed in accordance with Shannon & Wilson, Inc.'s August 2014 *Work Plan*. Field methods are presented in the following sections. Deviations to the *Work Plan* are summarized in Section 3.1.7.

3.1 Work Plan Strategy

3.1.1 Project Personnel

Julie Keener, P.E. serves as the Project Manager for Shannon & Wilson. Ms. Keener is responsible for routine technical, financial, and administrative aspects of the project, and managed remediation-related field efforts in both 2013 and 2014. Jake Tracy, EIT, served as the Shannon & Wilson Field Technician (FT), and was present each day during excavation activities in 2013 and 2014. He was responsible for field-screening and sampling tasks as well as coordinating with the City and observing the excavation. He has considerable experience field-screening soils for hydrocarbon contamination using the PID, and his resume is included in Appendix A. He meets the requirements of a qualified person as defined in 18 AAC 78.995 (118).

Mr. Patrick Moore, City Building and Maintenance Department, served as the Site Superintendent and the City's point of contact. Mr. Moore supervised the excavations, which were conducted by City personnel using City equipment.

3.1.2 Landfarm Preparation Activities

The 2013 landfarm was expanded by approximately 8,000 square feet in order to accommodate additional material excavated on August 26 through 29, 2014. The land was leveled and smoothed, and additional 4-foot-wide, 3-foot-high soil berms were constructed to contain the new landfarm area. The base of the new landfarm was field-screened using a PID in a grid pattern, and confirmation samples were collected from the areas with the highest PID results.

3.1.3 Soil Management Plan

During excavation at the Site the FT screened soil for VOCs using a PID, and segregated the soils accordingly. Soil with PID field-screening results less than 20 ppm would be assumed to be "clean," but require analytical sampling to verify they did not exceed soil-cleanup levels. No "clean" soil was excavated in 2014, and thus no clean-soil stockpiles were created.

Soil with field-screening results 20 ppm and greater or which exhibited petroleum-hydrocarbon staining or odor was assumed to be contaminated. These soils were excavated and transported directly to the offsite landfarm using a 10-cubic-yard dump truck. Analytical soil samples were collected from the soil with the highest field-screening results either before or after the soil was transferred to the landfarm, to characterize the level of soil contamination.

Shannon & Wilson, Inc.'s *Contaminated Soil Landfarming Plan* was provided in Appendix E to the *Work Plan* dated September 4, 2014. The landfarm was constructed by creating a level area on the ground surface surrounded by a soil berm which is a minimum of 100 feet from a water source. The landfarm has no bottom liner. Soil was spread with a target thickness of 1.5 feet, and a soil berm was created with an average height of 3 feet. Landfarm management is coordinated by the City of Tanana and is ongoing.

3.1.4 Field Screening Procedures

Field screening procedures were presented in Section 2.3 of the *Work Plan*, and are summarized here.

Shannon & Wilson used a PID as the petroleum-screening tool. The instrument was a hand-held MiniRae 2000 Portable VOC Monitor (Model PGM 7600) manufactured by Rae Systems, Inc. The PID measures total volatile compounds present as vapors and is used as a semi-qualitative indication of hydrocarbons present. The MiniRae provides a three-second response time up to 10,000 ppm. The detector was calibrated daily to a 100-ppm isobutylene standard according to the manufacturer's instructions.

Shannon & Wilson's FT field-screened soils using a PID as excavation progressed. Soil was field-screened *in situ* in the excavation or in the excavator bucket. This was done by using a clean stainless steel spoon or trowel to make a hole in the soil a few inches deep then inserting the probe of the PID to take a reading. If the *in situ* reading was 20 ppm or greater, it was not necessary for the FT to collect a headspace sample. If the *in situ* PID reading was less than 20 ppm, the FT collected a headspace sample to aid segregation of the soil.

The FT collected headspace samples for field screening at a minimum rate of one sample per 10 cubic yards of excavated soil.

The FT screened the headspace samples within one hour of collection. Following screening, the FT emptied the headspace soil samples from the bags at the sample location or on the appropriate stockpile, based on the PID results.

3.1.5 Analytical Sampling Rationale and Frequency

Section 3.1 of the *Work Plan* specified the approximate number of samples to be collected and the analyses to be performed.

3.1.5.1 Landfarm Area

The landfarm area consists of two cells, which were constructed in 2013 and 2014, respectively. The first cell, approximately 23,000 square feet in area, was constructed to accommodate soil excavated in September 2013. The original landfarm was expanded to create a second cell of approximately 8,000 square feet.

In order to characterize the native soil in this area, the FT collected analytical soil samples from those locations at the base of the landfarm that had the highest PID results. We collected two analytical samples from the 2014 expansion area, from a depth of 6 inches bgs. Refer to Appendix B, Field Notes for 2014 sample locations.

3.1.5.2 Excavations

Two areas were excavated in August 2014: a small area in the southwest corner of existing Excavation 1, and a larger area in the northwest corner of Excavation 2 and up to the property line (Figure 2, 2014 Soil-Sample Locations). The FT field-screened soils from the base and sidewalls of each excavation, and collected analytical samples from the locations with the highest PID results. Two analytical samples and one duplicate were collected from the expansion of Excavation 1, one from the base and one from the sidewall.

Soil was excavated between 7 and 9 feet bgs in the northwest corner of the Site at Excavation 2. PID readings were taken from the base and sidewalls in a grid pattern, and 10 analytical samples and two duplicate soil samples were collected, half from the base and half from the sidewalls.

3.1.5.3 Clean and Contaminated Soil

We planned to collect samples of stockpiled clean soil to verify that the soil does not exceed SCLs, however no clean soil was encountered during the 2014 excavation. We collected samples of contaminated soil after placement in the landfarm to characterize the concentrations of COPCs. Following the transportation and spreading of contaminated soil at the landfarm, we took 45 PID readings and collected six analytical samples and one duplicate soil sample from landfarmed soils.

3.1.6 Analytical Sampling

Analytical sampling procedures were presented in Sections 3.1 and 3.2 of the *Work Plan* and are summarized here.

Shannon & Wilson's FT determined analytical-sample locations based on field-screening results; he collected analytical samples from locations with the highest field screening results. He collected and handled analytical samples in accordance with the *Draft Field Sampling Guidance*. He collected Quality Control (QC) samples according to the Quality Assurance Project Plan (Section 4.0 of *Work Plan*).

All soil samples were discrete grab samples and not composited. Samples collected for GRO/BTEX analytes were field-preserved with methanol.

We submitted samples to SGS North America, Inc. (SGS) in Anchorage, Alaska. SGS is certified to perform analyses required under the ADEC underground storage tank (UST) program, meets ADEC-acceptance criteria, and has received National Environmental Laboratory Accreditation Program validation. We submitted samples for analysis of BTEX by Environmental Protection Agency (EPA) Method 8021B, DRO by Alaska Method AK 102, GRO by AK 101, and PAHs by EPA Method 8270D.

3.1.7 Deviations from Work Plan

The *Work Plan* called for the collection of 32 analytical samples: 28 primary samples and 4 duplicate samples with 15 of the samples to be collected from "clean and contaminated soils stockpiles". During the excavation no "clean" soil was encountered, therefore the FT did not create or collect analytical samples from a clean soil stockpile. Since 15 samples of contaminated soil stockpiles (i.e. landspread soils) was deemed excessive, additional samples were instead

collected from the new landfarm area and excavations. In total the FT collected 29 analytical samples (24 primary samples and 5 duplicate samples). As detailed in the *Work Plan*, each sample was analyzed for GRO, DRO, and BTEX and a small subset were analyzed for PAHs.

The PID field-screening tool was not calibrated on August 26, 27, or the morning of August 28, 2014 due to an error with the calibration device. Replacement calibration equipment was shipped to Tanana on August 28 and used for the remainder of the field excavation and sampling effort. Field personnel compared pre- and post-calibration results to determine if PID concentrations appeared consistent. The FT confirmed that PID results for previously screened material had similar ppm range post-calibration.

3.2 Field Activities and Observations

Following is a summary of our 2014 field observations and sampling activities conducted in accordance with Shannon & Wilson's August 2014 *Work Plan*, which was approved by ADEC. The field activities took place August 26-29, 2014.

Field-screening and analytical-sample locations are shown in Figure 2, 2014 Soil-Sample Locations. A copy of the Field Notes is provided in Appendix B. The Field Notes include field-screening results and locations. Representative photographs of the excavation and landfarm areas and work progress are presented in Appendix C.

3.2.1 Landfarm Area

The 2013 landfarm area is north of the Tanana Landfill, and was expanded to accommodate additional excavated soil in August 2014. The newly cleared area is labeled "landfarm expansion" on pages 1 and 2 of the 2014 Field Notes (Appendix B). The new and old landfarm cells are separated by a soil berm.

On August 26, 2014, prior to placement of contaminated soil in the addition to the landfarm, the FT collected 40 field-screening samples in a grid pattern in the cleared and newly constructed portions of the new cell of the landfarm. The new cell is approximately 8,000 square feet in size. Native soil in the landfarm addition was moist brown sandy silt with a trace of organics. PID field-screening results ranged from less than 1 ppm to 15 ppm. Soil with PID results less than 20 ppm is considered "clean."

Four analytical samples and one duplicate sample were collected from the previously cleared zone of the new landfarm (*LFS01, LFS10/LFS50, LFS13, LFS27*). Full analytical sample names are preceded by "*11697101-*," as referenced in Tables 1 and 2. Two analytical samples were collected from the newly cleared zone to the south (*LFS31, LFS35*). Refer to pages 1 and 2 of the

field notes for a sketch of field-screening and analytical-sample locations in the landfarm area (Appendix B).

3.2.2 2014 Excavation

The 2014 excavation activities focused on two areas: the southwestern portion of Excavation 1, and the northwestern portion of Excavation 2.

The FT selected analytical-sample locations based on field-screening results and direct observation, collecting analytical samples from locations with the highest field-screening results. He collected and handled analytical samples in accordance with our August 2014 *Work Plan*. Soil encountered in both additions to the excavations was moist brown sandy silt, and exhibited a hydrocarbon odor and elevated field-screening results. Excavation was terminated when the total volume of contaminated soil transported to the landfarm was about 500 cy. On August 29, the City used a wheeled front-end loader to backfill the newly excavated areas with the 2013 clean stockpiles. Contaminated soil remained in the excavations.

3.2.2.1 Excavation 1

On August 27, 2014, City personnel began excavation at the southwest corner of Excavation 1 (Photos 1-3). The final dimensions of the addition to Excavation 1 were about 10 feet by 10 feet by about 7 feet deep (Figure 2). The FT collected eight samples from the sidewalls and base of Excavation 1 for field-screening; PID results ranged from 2 to 200 ppm. He then collected two primary samples and one duplicate sample at representative locations (*EX1BS02, EX1SW01/ EX1SW51*). Figure 2 shows the field-screening and analytical sample locations in the addition to Excavation 1.

3.2.2.2 Excavation 2

On August 26 and 27, 2014, City personnel began excavation at the northwest corner of Excavation 2 (Photo 4-9). The final dimensions of Excavation 2 were about 55 feet north-south by 22 to 48 feet east-west (Figure 2). The final depth of the additional excavation ranged from 7 to 9 feet bgs. The FT collected 38 field-screening samples; PID results ranged from zero ppm to 620 ppm. He collected 10 primary samples plus two duplicate samples for laboratory analysis, five from the base (*EX2BS01/EX2BS51, EX2BS06/EX2BS56, EX2BS07, EX2BS13, EX2BS16*) and five from the sidewalls (*EX2SW04, EX2SW05, EX2SW08, EX2SW09, EX2SW017*). Figure 2 shows the field-screening and analytical sample locations in the addition to Excavation 2.

3.2.3 Landfarmed Contaminated Soil

The City placed a total of 65 truckloads of contaminated soil at about 8 cy each. Following placement of the contaminated soil, City personnel spread the soil to a depth of about 1.5 feet with a bulldozer. On August 28, the FT collected analytical soil samples to characterize the levels of contamination in the landfarmed soil. He collected 45 field-screening samples in a grid pattern of the soil spread in the landfarm area. PID results ranged from 110 ppm. He then collected six primary and one duplicate BTEX soil sample from a depth of six inches from the locations with the highest PID results (*LSS07/LSS57, LSS08, LSS24, LSS33, LSS36, LSS43*). Photo 10 shows the landfarm area with surrounding soil berms.

4.0 ANALYTICAL RESULTS

PID field-screening results are presented on pages 5 through 11 of the Field Notes (Appendix B). Table 1 summarizes DRO, GRO, and BTEX sample results and SCLs, as well as sample locations and depths. Table 2 summarizes detected PAH sample results, SCLs, and sample locations. The laboratory report and associated ADEC data-review checklist are included in Appendix D.

4.1 Regulatory Levels

For the landfarm-area soils, prior to placement of excavated, contaminated soil, the soil cleanup levels were the MTG SCLs for the Under 40-inch Precipitation zone.

As stated in the ADEC Decision Document, the default soil-cleanup levels for the Site are established in 18 AAC 75.341, Method Two, Table B1 and B2, Under 40-inch Zone, Migration to Groundwater. These cleanup levels are applicable to both the soil remaining in the excavations and the "clean" soil excavated from the site in 2013. The SCLs referenced are the most stringent established, which in most cases is MTG SCLs. For some PAH analytes the direct-contact SCL is the most stringent. SCLs for each analyte detected are presented in Tables 1 and 2.

We understand that the City plans to use the landspread soil as daily cover on the Tanana landfill following treatment. For beneficial reuse as cover on the landfill, landspread soil must meet target levels for GRO and DRO established by the ADEC Solid Waste Division (900 mg/kg and 2,000 mg/kg, respectively); criteria for other analytes will be established by ADEC. The City must obtain permission from ADEC Solid Waste Program prior to use of the soil as cover material.

For soil remaining at the Site, GRO and DRO SCLs are 300 mg/kg and 250 mg/kg, respectively. BTEX SCLs are 0.025 mg/kg for benzene, 6.5 mg/kg for toluene, 6.9 mg/kg for ethylbenzene, and 63 mg/kg for total xylenes. Of the 18 PAH analytes quantitated, eight were detected: acenaphthene, anthracene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. In the same order, SCLs for these analytes are 180 mg/kg, 3,000 mg/kg, 220 mg/kg, 6.2 mg/kg, 6.1 mg/kg, 20 mg/kg, 3,000 mg/kg, and 1,000 mg/kg.

4.2 Landfarm Area

PID results of the 39 field-screening samples in the landfarm area prior to placement of contaminated soil were 15 ppm or less. GRO was detected in two soil samples, and *o*-xylene was detected in one soil sample from the landfarm area prior to the placement of contaminated soil. DRO was detected in five of the six samples and one duplicate sample at up to 138 mg/kg, which is less than the MTG SCL (Table 1). Samples from the landfarm base were not submitted for PAH analysis.

4.3 Excavation No. 1

PID results of the field-screening samples from Excavation 1 were as high as 200 ppm. DRO was detected in the two samples and one duplicate sample from Excavation 1 at up to 10,400 mg/kg. DRO concentrations in both samples collected from Excavation 1 exceeded the MTG SCL of 250 mg/kg. GRO was detected in the two samples and one duplicate sample at up to 156 mg/kg, estimated and biased high. Neither of the Excavation 1 samples exceeded the GRO SCL.

Benzene was not detected in the samples from Excavation 1. Toluene, ethylbenzene, *o*-xylene, and *p*- & *m*-xylenes were detected in the two samples and one duplicate sample. Neither of the Excavation-1 samples exceeded SCLs for BTEX (Table 1). Samples from Excavation 1 were not submitted for PAH analysis.

4.4 Excavation No. 2

PID results of the field-screening samples from Excavation 2 were as high as 620 ppm. DRO was detected in each of the 10 samples and two duplicate samples at up to 27,700 mg/kg. DRO concentrations reported for these samples exceeded the SCL of 250 mg/kg. GRO was detected in each of the 10 samples and two duplicate samples at up to an estimated 267 mg/kg. None of these samples exceeded the GRO SCL of 300 mg/kg (Table 1).

Benzene was detected in seven samples and two duplicate samples at up to 0.189 mg/kg. Four samples and two duplicate samples exceeded the benzene SCL of 0.025 mg/kg. Toluene was detected in seven samples and both duplicates, and ethylbenzene, *o*-xylene, and *p*- & *m*-xylenes were detected in 10 samples and both duplicates. The highest concentrations for toluene,

ethylbenzene, *o*-xylene, and *p*- & *m*-xylenes were 0.105 mg/kg, 3.99 mg/kg, 18.3 mg/kg, and 13.4 mg/kg, respectively. None of the Excavation-2 samples exceeded the SCLs for toluene, ethylbenzene, and xylenes (Table 1).

Eight PAH analytes were reported in the two samples and one duplicate sample from Excavation 2 that were tested for PAHs. Two samples and one duplicate sample exceeded SCLs for 1-methylnaphthalene and 2-methylnaphthalene, with the highest concentrations at 46.2 mg/kg and 51.9 mg/kg, respectively. One sample and the associated duplicate sample exceeded SCL for naphthalene, with the highest concentration at 21.0 mg/kg. The SCL for naphthalene is 20 mg/kg (Table 2).

4.5 Landfarmed Contaminated Soil

PID results of the field-screening samples from the soil placed in the landfarm ranged from 110 to 690 ppm. GRO and DRO were detected in each of the six samples and one duplicate sample at up to 226 mg/kg and 22,400 mg/kg, respectively. GRO concentrations did not exceed ADEC's target level for disposal, but DRO concentrations in each sample did.

Benzene was detected in three of the landfarmed soil samples and one duplicate sample, and the concentration in one of these samples (0.0257 mg/kg) slightly exceeded the SCL (0.025 mg/kg). Toluene, ethylbenzene, *o*-xylene, and *p*- & *m*-xylenes were detected in all six of the landfarmed soil samples and one duplicate sample, but concentrations did not exceed ADEC's most stringent SCLs.

One landfarm soil sample was analyzed for PAHs, and 7 of the 18 analytes were detected. The concentrations of 1-methylnaphthalene and 2-methylnaphthalene, at 59.2 mg/kg and 8.91 mg/kg, respectively, exceeded SCLs (Table 2).

4.6 Analytical Data Quality Control Review

Quality Assurance/Quality Control (QA/QC) procedures assist in producing data of acceptable quality and reliability. We reviewed the analytical results for laboratory QC samples and also conducted our own QA assessment for this project. We reviewed the chain of custody record and laboratory-receipt form to check that custody was not breached, sample holding-times were met, and the samples were properly handled from the point of collection through analysis by the laboratory. Our QA review procedures allowed us to document the accuracy and precision of the analytical data, as well as check the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards.

We reviewed analytical soil-sample results (SGS work order 1148458) for this project. The SGS laboratory report, including the case narrative describing the laboratory QA results in detail, are

included with the completed ADEC data-review checklist in Appendix D. Flags have been added to results as needed, and are included in Tables 1 and 2. Details regarding the results of our QA review are presented in Appendix E.

By working in general accordance with our proposed scope of services, we consider the samples we collected for this project to be representative of site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to QC failures, and our completeness goal of obtaining 85-percent useable data was met. We collected sufficient field-duplicate samples to meet a minimum rate of 10 percent, as proposed. In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities and is adequate for the purposes of our assessment.

5.0 CONCEPTUAL SITE MODEL

We prepared a conceptual site model (CSM) for the Site; the completed ADEC CSM scoping form and graphic are included in Appendix F. The CSM developed for the Site describes the primary contaminant sources, release mechanisms, secondary sources, mechanisms of retention in or transport of exposure media, receptors who may come in contact with the exposed media, and intake routes through which receptors may be exposed.

5.1 Potential Contaminants of Concern and Affected Media

The 2012 ADEC Contaminated Site Decision Document identifies DRO, GRO, and benzene as COPCs at the Site. The 2014 sampling effort further identifies three PAH analytes as COPCs: 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene. These six COPCs do not have the potential to bioaccumulate in plants or animals.

DRO is the primary COPC, and was detected in all analytical samples collected from the 2014 excavation expansions at concentrations exceeding the MTG SCL. Most of the samples from the excavations, which characterize the soil remaining in place at the Site, have DRO concentrations above the direct-contact SCL and some have concentrations above the ingestion SCL. GRO was not reported above the most stringent SCL or ADEC target level for disposal in any sample. Benzene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were reported in excavation samples above the MTG SCLs but below the direct-contact and ingestion SCLs.

Contamination is concentrated at depths greater than 3.5 feet bgs, and PID results for soils in the upper 2 feet bgs are less than 20 ppm (i.e. “clean”). Surface soil is not believed to be contaminated.

There are no water bodies on the Site. Precise depth to groundwater is unknown, but GW was encountered at the base of a 21.5-foot-deep test pit in 2010. Permafrost is present at depth of 8 feet and greater. The Yukon River is located within 100 feet of the property boundary and is downgradient topographically. Pore-water sampling of the groundwater-surface water interface in 2012 indicated that contamination is not migrating through groundwater to the Yukon River.

5.2 Exposure Pathways

Primary exposure pathways include incidental soil ingestion, inhalation of indoor and outdoor air, and ingestion of groundwater. These four primary exposure pathways are controlled through institutional controls. Secondary exposure pathways with a de-minimis exposure risk include dermal absorption of contaminants from soil and exposure to ecological receptors. The CMS graphic form (Appendix F) and Table 3 present an evaluation of potential exposure pathways.

Incidental ingestion of subsurface soil is controlled through access to the Site, and through burial of contaminated soil. Excavated material was replaced with clean fill, thus the base and sidewalls of the excavation are no longer accessible. Inhalation of outdoor air is also controlled through access to the Site. These exposure pathways have the potential to impact future construction workers.

The current risk of inhalation of indoor air is zero as there are no structures present on the property. The City plans to construct two buildings, and vapor intrusion controls are recommended to reduce or eliminate vapor intrusion into these buildings. Refer to Sections 6.1.5 and 6.2.1 for more information regarding vapor intrusion exposure potential and mitigation.

The ingestion-of-groundwater pathway is considered complete due to the presence of multiple COPCs exceeding MTG cleanup levels. However, exposure is controlled since ADEC institutional controls prohibit the installation of a groundwater well on the property.

Dermal absorption of contaminants in soil is considered a de-minimis exposure risk due to the depth of contaminated soil, which is primarily greater than 3.5 feet bgs. The potential for exposure to ecological receptors is considered low given the minimal presence of contaminants in the soil root zone. The potential for exposure to sediment and surface water runoff into the Yukon River is considered low due to the depth of contaminated soil.

5.3 Cumulative Risk Evaluation

Alaska statute 18 AAC 75.325(g) states a responsible party applying SCLs found in 18 AAC 75.341 (Method Two) or groundwater cleanup levels found in 18 AAC 75.345 “shall ensure that, after completing site cleanup, the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a

cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways." Cumulative risk is defined as the sum of risks resulting from multiple sources and pathways to which humans are exposed. The ADEC's *Cumulative Risk Guidance* (June 2008) states, "when more than one hazardous substance is present at a site or multiple exposure pathways exist, the cleanup levels in Table B1 of 18 AAC 75.341 and Table C of 18 AAC 75.345 may need to be adjusted downward."

We calculated the cumulative risk for soil analytes remaining at the Site, since more than one chemical or more than one exposure pathway (e.g., inhalation and direct contact) for a single chemical was present exceeding one-tenth of their 18 AAC 75 Table B1 direct contact or inhalation soil-cleanup levels. The highest detected concentration for each soil analyte exceeding the Table B screening threshold (i.e., one-tenth of the tabulated direct contact or inhalation cleanup level), and risk-based concentration data provided in the ADEC's *Cumulative Risk Guidance*, was used to conduct the cumulative risk evaluation (CRE). The ADEC does not require petroleum hydrocarbons (i.e., GRO, DRO, and RRO) to be included in the CRE.

Some chemicals (e.g., ethylbenzene) have both carcinogenic and noncarcinogenic effects; in some cases, the same analytical result was used in the CRE to calculate a cumulative carcinogenic risk and noncarcinogenic hazard index. Some chemicals may pose exposure risks through more than one pathway (e.g., ethylbenzene in soil via direct contact and inhalation). When more than one exposure pathway was possible for a given analyte found at the site, each pathway was included in the CRE, using the appropriate risk-based concentration provided in ADEC's *Cumulative Risk Guidance* to evaluate the incremental risk associated with that contaminant and its exposure routes.

Table 4 summarizes the results of our CRE. Note that the CRE includes both 2013 and 2014 analytical results characterizing soil remaining in the excavations. We conclude the cumulative risk due to carcinogens remaining on the Site does not exceed 10^{-5} and the noncarcinogenic hazard index does not exceed 1.0, so the remaining concentrations on the Site do not present an unacceptable level of risk.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following sections are our conclusions and recommendations, which are based on our observations of the Site and field screening and analytical results from 2014 field activities.

We provide conclusions regarding the new cell of the landfarm, soil contaminant concentrations at the Site, and potential current and future risks due to remaining soil contamination at the Site.

6.1 Landfarm Area

The existing 2013 landfarm was expanded by approximately 8,000 square feet with the construction of a new cell. Analytical sampling results, field screening results, and direct observation of the landfarm area prior to the addition of contaminated material support the conclusion that the soil on which the landfarm was constructed is uncontaminated. GRO, DRO, and *o*-xylene were detected in samples from this area at less than the most stringent SCL. We conclude this area was not contaminated prior to placement of contaminated soil for this project.

6.2 2014 Excavation Areas

Portions of Excavations 1 and 2 (2013) were expanded in order to remove additional soil, not to exceed approximately 500 cy. Analytical results confirm that soil left in place in the base and sidewalls of the 2014 excavations exceeds SCLs.

DRO was detected above the MTG SCL in the 10 primary Excavation 2 samples and two duplicate samples, and the two primary Excavation 1 samples and one duplicate sample. All samples from Excavation 2 and one from Excavation 1 also exceeded the direct-contact DRO SCL. Some samples from Excavation 2 also exceed the ingestion DRO SCL. Benzene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected in excavation samples exceeding the MTG SCL but less than the direct-contact and ingestion SCLs.

The 2014 excavation effort succeeded in removing additional contaminated soil, particularly soil that is easily accessible and close to the ground surface. However, contaminated soil with DRO, benzene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations above ADEC SCLs remain in place at the Site. The highest concentrations of these analytes detected in 2014 excavation samples are 27,700 mg/kg, 0.189 mg/kg, 46.2 mg/kg, 51.9 mg/kg, and 21.0 mg/kg, respectively.

6.3 Landfarmed Contaminated Soil

Approximately 500 cy of contaminated soil were removed from the Site and placed in a new cell adjacent to the existing 2013 landfarm. Contaminated soil excavated in 2014 was not mixed with soil excavated in 2013, and the two cells are separated by a soil berm. Soil was spread to a thickness of approximately 1.5 feet as recommended in the *Contaminated Soil Landfarming Plan*.

We performed analytical sampling to characterize the contaminated soil upon its placement in the landfarm. The six landspread soil samples and one duplicate sample were found to have concentrations of DRO exceeding the ADEC target level for disposal, MTG, and direct-contact SCLs. Four samples also exceeded the DRO ingestion SCL. Benzene was detected exceeding the

MTG SCL in one sample, and 1-methylnaphthalene, and 2-methylnaphthalene were detected exceeding the MTG SCL in the one sample and one duplicate sample tested. Naphthalene was detected, but at concentrations less than its most stringent SCL. The highest concentrations of these analytes detected in 2014 landspread-soil samples are 22,400 mg/kg, 0.0257 mg/kg, 59.2 mg/kg, and 8.91 mg/kg, respectively.

Both landfarm cells are managed by the City, which coordinates ongoing landfarming activities. Aeration and drainage maintenance will enhance volatilization and biological remediation. The City may reuse landfarmed soil as cover at the Tanana Landfill following sufficient time for natural attenuation to occur, with approval from the ADEC.

6.4 Current and Future Risks

Shannon & Wilson, Inc. prepared both a CSM and CRE in order to evaluate potential current and future risks due to remaining fuel contamination at the Site. The CSM identified four primary exposure pathways including incidental soil ingestion, inhalation of indoor and outdoor air, and ingestion of groundwater (Appendix F; Table 3). These four primary pathways are considered controlled due to the nature of contamination remaining at the Site and institutional controls in place following the 2012 ADEC *Decision Document*. The CSM also identifies two secondary exposure pathways with a de-minimis exposure risk: dermal absorption of contaminants from soil and exposure to ecological receptors. We conclude that there are minimal risks to site users if present-day controls remain in place.

6.5 Potential Vapor-Intrusion Exposure Pathway

Based on our understanding of the City's proposed future use of the site and the results of our field-screening and soil-sampling activities described in this report, we conclude that inhalation of indoor air due to vapor intrusion is a likely exposure pathway in future structures. Vapor intrusion (VI) is defined as the migration of volatile chemicals from a subsurface vapor source into overlying buildings.

GRO and DRO are present in *in situ* soil remaining in the 2013 Excavations 1 and 2, as well as the 2014 additions to Excavation 1 and 2. Of these, DRO concentrations greatly exceed their SCL; GRO was present but at concentrations less than its SCL. The volatile compounds benzene, ethylbenzene, toluene, xylenes, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene are also present in *in-situ* soils in both excavations. These VOCs are referred to as "volatile compounds of potential concern" for the purpose of evaluating the indoor-air exposure pathway as part of a CSM. In addition, CSM guidance requires that inhalation of indoor air be considered an exposure pathway if a structure is within 30 feet of petroleum-contaminated soil and volatile compounds are present. The presence of petroleum hydrocarbons and VOCs in site soil is the basis for our conclusion. It should be noted, however, that the ADEC's October 2012 *Vapor*

Intrusion Guidance for Contaminated Sites includes the following statement regarding the use of soil data alone to assess vapor intrusion potential:

> Soil data collection is useful for investigating the nature and extent of contamination and evaluating the potential for vapor intrusion; however, DEC has not calculated target levels for soil, and soil data can only be used qualitatively.

The extent of VI and level of risk will depend on the specific site-development plans, including foundation designs and possible VI mitigation measures to be implemented for structures to be built on site.

6.6 Recommendations

The City plans to construct two buildings on the Site (a multi-purpose community services facility to replace the current Town Hall and housing facility). We recommend that additional precautions be put in place to protect construction workers and passers-by from incidental soil ingestion, direct contact with contaminated soil, and inhalation of outdoor air during construction. We further recommend that new construction be designed to mitigate soil vapor intrusion, as described below.

6.6.1 Vapor-Intrusion Mitigation

When planning a new structure to be built atop a potential VI source such as petroleum-contaminated soil, the designer should consider methods to prevent contaminated vapors from migrating into the structure. The VI exposure pathway can be mitigated using various passive or active measures, most of which can be integrated into the building's design to limit excessive additional construction costs. Active measures such as sub-slab depressurization systems, indoor-air purifiers, and adjustments to building air handling systems are typically considered when assessing mitigation efforts to existing structures.

Passive measures such as installing a sub-slab ventilation system or chemical-resistant passive membranes, sealing the building envelope, or building on piles or piers are appropriate measures the City should consider when planning future development at the site. We recommend the City work with a prospective design professional to incorporate one or more of these passive measures into the design and construction of proposed structures at the site.

6.6.1.1 Sub-Slab Ventilation

Sub-slab ventilation can be achieved by installing a network of horizontal piping under and/or around the perimeter of a building prior to its construction. The network may include manifolds to connect ventilation piping, and should be vented to the outdoors. Wind-driven turbine caps may be used to increase air flow.

6.6.1.2 Membranes

Membranes are intended to provide a physical barrier to vapor intrusion. These barriers should be placed between the VI source (contaminated soil) and the underside of the structure. Sheet membranes are typically 40-60 mil high-density polyethylene or a similar chemical-resistant material. Fluid-applied membranes are mixtures sprayed on the ground surface to a specified thickness, then allowed to cure.

6.6.1.3 Sealing the Building Envelope

During construction of a structure over contaminated soil, care should be taken to ensure the building envelope is properly sealed. The objective of this process is to limit the potential for contaminated vapors to enter the building. Standard vapor-barrier construction techniques should meet this objective.

6.6.1.4 Pile Construction

Structures built on piles or piers, leaving an open area between the structure and ground surface, will rarely need VI mitigation. The free flow of outdoor air through the open area will limit the potential for vapor intrusion into the overlying structure.

6.6.2 Landfarmed Soil

We recommend the City follow the treatment recommendations we presented in our August 2014 *Contaminated Soil Landfarming Plan* to meet the ADEC Target Levels for beneficial reuse at the City of Tanana landfill. We also recommend that the soil under the contaminated landfarmed soil be sampled again at the completion of landfarming activities and removal of landfarmed soil.

7.0 LIMITATIONS

This report was prepared for the use of the ADEC and its representatives to document soil conditions at the Former Tanana Power Company site, in Tanana, Alaska. This work presents our professional judgment as to the conditions in the site. Information presented here is based on the sampling and analyses we performed. It should not be construed as a definite conclusion about the soil conditions in the area, and it is possible our tests do not represent the highest levels of contamination at the site.

The information included in this report should be considered representative of the time and location at which the sampling occurred. It was not the intent of our investigation to detect the presence of soil contaminants other than those for which laboratory analyses were performed. No conclusions can be drawn on the presence or absence of other contaminants. The observed levels

of contamination may be dependent upon changes due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, or other factors beyond our control, our observations and recommendations applicable to this site may need to be revised. If substantial time has elapsed between submission of this report and the start of activities or action based upon it, we recommend this report be reviewed to determine the applicability of the conclusions.

This report was prepared for the exclusive use of our client. All documents prepared by Shannon & Wilson are instruments of service with respect to the project for the sole use of our client. Only our client shall have the right to rely upon such documents. Such documents are not intended or represented to be suitable for reuse by our client or others after the passage of time, on extensions of the project, or on any other project. Any such reuse without written verification or adaptation by Shannon & Wilson, as appropriate for the specific purpose intended, shall be at the user's sole risk.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) signed or sealed by Shannon & Wilson. Text, data, or graphics files in electronic media format are furnished solely for the convenience of our client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

Because data stored in electronic media can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the client should perform acceptance tests or procedures within 60 days after its receipt, after which, unless notice of any errors are given in writing to Shannon & Wilson, the client shall be deemed to have accepted the data thus transferred. Any errors reported within the 60-day acceptance period shall be corrected by Shannon & Wilson. Shannon & Wilson shall not be responsible for maintaining documents stored in electronic media format after acceptance by the client.

When transferring documents in electronic media format, Shannon & Wilson does not make any representations as to long-term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used for the document's creation.

8.0 REFERENCES

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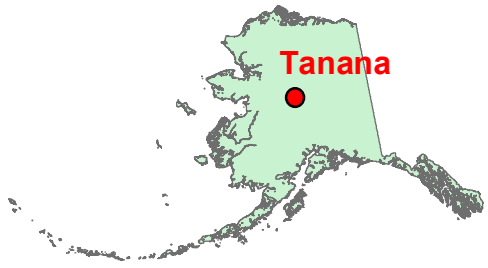
X1650-1699\1697 ADEC Tanana Power\101 Revised Work Plan\working files\1697 Figure1.mxd

Image courtesy of State of Alaska Department of Commerce, Community, and Economic Development.



N

Former Tanana Power Company Site
Tanana, Alaska

VICINITY MAP

May 2015

31-1-11697-103

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

SECOND AVENUE

BLOCK 10, LOT 8

BLOCK 10, LOT 7

EXCAVATION 2

EXCAVATION 1

HILL STREET

FIRST AVENUE

EX2BS1

EX2BS6

EX2SW4

EX2SW5

EX2BS6

EX2BS13

EX2BS16

EX2SW8

EX2SW9

EX2BS17

EX1BS2

EX1SW1

SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8 SW9 SW10 SW11 SW12 SW13 SW14 SW15 SW16 SW17 SW18 SW19 SW20

BS1 BS2 BS3 BS4 BS5 BS6 BS7 BS8 BS9 BS10 BS11 BS12 BS13 BS14 BS15 BS16 BS17 BS18

0 50

Feet

Legend:

- Laboratory Sample

Field-Screening Sample PID Reading

- <20 ppm
- 20 - 100 ppm
- >100 ppm
- 2013 Excavation Extent
- 2014 Excavation Extent
- Property Line

Notes:
All locations are approximate.
Air photo: State of Alaska Division of Community & Regional Affairs, 6/10/2009

N

Former Tanana Power Company Site
Tanana, Alaska

2014 SOIL-SAMPLE LOCATIONS

May 2015

31-1-11697-103

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2

TABLE 1. SUMMARY OF ANALYTICAL RESULTS (GRO, DRO, BTEX)
2014 CORRECTIVE ACTION, FORMER TANANA POWER COMPANY SITE

Sample Number	Sample Date	Sample Location	Depth (ft bgs)	GRO	DRO	Benzene	Toluene	Ethyl-benzene	*o*-Xylene	*p*- & *m*-Xylenes
11697101-LFS01	8/26/14	Landfarm area	0.5	<1.55	133	<0.00780	<0.0156	<0.0156	<0.0156	<0.0311
11697101-LFS10	8/26/14	Landfarm area	0.5	<1.60	32.4	<0.00795	<0.0159	<0.0159	<0.0159	<0.0319
11697101-LFS50	8/26/14	Duplicate of *LFS10*	0.5	<1.74	30.9	<0.00865	<0.0174	<0.0174	<0.0174	<0.0347
11697101-LFS13	8/26/14	Landfarm area	0.5	<2.03	105	<0.0101	<0.0203	<0.0203	<0.0203	<0.0406
11697101-LFS27	8/26/14	Landfarm area	0.5	<1.76	138	<0.00880	<0.0176	<0.0176	<0.0176	<0.0352
11697101-LFS31	8/26/14	Landfarm area	0.5	1.16 J	<10.8	<0.00755	<0.0151	<0.0151	<0.0151	<0.0302
11697101-LFS35	8/28/14	Landfarm area	0.5	1.15 J	11.9 J	<0.00810	<0.0163	<0.0163	0.0166 J	<0.0325
ADEC Soil-Cleanup Level[a]				300	250	0.025	6.5	6.9	63 (total)	
11697101-EX2BS01	8/28/14	Base of Excavation 2	7	147 JH*	13,900	0.0269	0.105	0.407	14.0	5.49
11697101-EX2BS51	8/28/14	Duplicate of *EX2BS01*	7	232 JH*	11,500	0.0349	0.145	0.572	18.3	7.29
11697101-EX2BS06	8/28/14	Base of Excavation 2	7	145 JH*	12,000	0.154	0.0665	3.99	5.56	6.35
11697101-EX2BS56	8/28/14	Duplicate of *EX2BS06*	7	93.2 JH*	12,900	0.108	0.0421	2.71	4.37	4.32
11697101-EX2BS07	8/28/14	Base of Excavation 2	7	95.9 JH*	14,000	0.189	0.733	3.18	5.84	9.96
11697101-EX2BS13	8/28/14	Base of Excavation 2	7.5	129 JH*	10,800	0.0315	0.240	3.94	2.39	13.4
11697101-EX2BS16	8/28/14	Base of Excavation 2	9	30.1 JH*	12,400	<0.0133	<0.0267	0.226	0.442	0.696
11697101-EX2SW04	8/28/14	Excavation 2 sidewall	3.5	267 JH*	27,700	0.00758 J	0.0250 J	0.232	4.87	0.691
11697101-EX2SW05	8/28/14	Excavation 2 sidewall	4	56.1 JH*	24,500	0.00783 J	0.0160 J	0.135	1.22	1.55
11697101-EX2SW08	8/28/14	Excavation 2 sidewall	4	177 JH*	17,000	0.0126 J	0.0534	0.513	3.34	0.788
11697101-EX2SW09	8/28/14	Excavation 2 sidewall	3.5	32.3	15,600	<0.0104	<0.0209	0.0142 J	1.06	0.283
11697101-EX2SW17	8/28/14	Excavation 2 sidewall	4	22.0	12,000	<0.00815	<0.0163	0.0202 J	0.701	0.158
11697101-EX1BS02	8/28/14	Base of Excavation 1	7	99.0 JH*	7,270	<0.00950	0.0129 J	0.0911	1.77	0.503
11697101-EX1SW01	8/28/14	Excavation 1 sidewall	4	156 JH*	10,400	<0.0101	0.0282 J	0.153	3.00	0.839
11697101-EX1SW51	8/28/14	Duplicate of *EX2SW01*	4	142 JH*	9,040	<0.00995	0.0259 J	0.136	2.69	0.751
ADEC Soil-Cleanup Level[a]				300	250	0.025	6.5	6.9	63 (total)	
11697101-LSS07	8/28/14	Landspread soil	0.5	119 JH*	**14,600**	0.0170 J	0.0494J J*	1.17	5.36 J*	4.89 J*
11697101-LSS57	8/28/14	Duplicate of *LSS07*	0.5	226 JH*	**22,400**	0.0245	0.0852 J*	1.60	9.44 J*	8.46 J*
11697101-LSS08	8/28/14	Landspread soil	0.5	76.3 JH*	**11,800**	<0.00795	0.0156 J	0.267	2.10	2.29
11697101-LSS24	8/28/14	Landspread soil	0.5	193 JH*	**13,300**	0.0257	0.0870	1.83	6.10	6.31
11697101-LSS33	8/28/14	Landspread soil	0.5	92.2 JH*	**12,200**	<0.00835	0.0221 J	0.552	1.96	2.55
11697101-LSS36	8/28/14	Landspread soil	0.5	111 JH*	**14,200**	0.0130 J	0.0400	1.18	3.29	3.87
11697101-LSS43	8/28/14	Landspread soil	0.5	133 JH*	**15,600**	<0.00880	0.0346 J	0.487	7.21	4.38
Target Level for Disposal[b]				900	2,000	—	—	—	—	—

Notes: All concentrations in units of milligrams per kilogram (mg/kg).
GRO Gasoline range organics
DRO Diesel range organics
BTEX Benzene, toluene, ethylbenzene, and xylenes

TABLE 1. SUMMARY OF ANALYTICAL RESULTS (GRO, DRO, BTEX)
2014 CORRECTIVE ACTION, FORMER TANANA POWER COMPANY SITE

[a]	ADEC soil-cleanup levels are from 18 AAC 75.341 Table B1 and B2 for the Under 40 inch Zone, Migration to Groundwater pathway.
[b]	For beneficial reuse as cover on the Tanana landfill, landspread soil must meet these target levels for GRO and DRO established by the ADEC Solid Waste Division; criteria for other analytes to be established by ADEC.
—	ADEC has not established target levels for these analytes for beneficial reuse as cover on the Tanana landfill.
ft bgs	Feet below the ground surface
<	Analyte concentration not reported above given Limit of Detection (LOD).
Yellow	Concentration exceeds ADEC soil-cleanup level.
BOLD	Concentration exceeds Target Level for Disposal.
J	Concentration is an estimate less than the Limit of Quantitation (LOQ).
JH*	Analyte concentration biased high due to matrix interference. Data-validation flag applied by Shannon & Wilson.
J*	Analyte concentration considered an estimate due to duplicate-sample imprecision. Data-validation flag applied by Shannon & Wilson.

TABLE 2. SUMMARY OF ANALYTICAL RESULTS (PAHs)
2014 CORRECTIVE ACTION, FORMER TANANA POWER COMPANY SITE

Sample Number	Sample Location	Depth (ft bgs)	Acenaphthene	Anthracene	Fluorene	1-Methyl-naphthalene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene
1697101-EX2BS06	Base of Excavation 2	7	1.68	0.620	2.44	46.2	51.9	20.7	3.48	<0.162
1697101-EX2BS56	Duplicate of *EX2BS06*	7	1.52	0.525	2.18	41.1	46.5	21.0	3.16	<0.163
1697101-EX2BS07	Base of Excavation 2	7	1.55	0.456	2.21	35.0	32.1	5.26	2.82	<0.156
ADEC Soil-Ceanup Level[a]			180	3,000	220	6.2	6.1	20	3,000	1,000
1697101-LSS07	Landspread soil	0.5	2.06	0.501 J	3.05	50.7	8.40	<0.307	3.52	0.189 J
1697101-LSS57	Duplicate of *LSS07*	0.5	<0.302	0.483 J	2.92	59.2	8.91	<0.302	3.46	<0.302
Target Level for Disposal[b]			—	—	—	—	—	—	—	—

Notes: Only detected PAH analytes are tabulated. Refer to analytical laboratory report for complete list of analytes.
All concentrations in units of milligrams per kilogram (mg/kg).
J Concentration is an estimate less than the Limit of Quantitation (LOQ).
[a] ADEC soil-cleanup levels are from 18 AAC 75.341 Table B1 and B2 for the Under 40 inch Zone, Migration to Groundwater pathway.
[b] For beneficial reuse as cover on the Tanana landfill, landspread soil must meet target levels for GRO and DRO established by the ADEC Solid Waste Division; criteria for other analytes to be established by ADEC.
Yellow Concentration exceeds ADEC soil-cleanup level.

TABLE 3. EXPOSURE PATHWAY EVALUATION
2014 CORRECTIVE ACTION, FORMER TANANA POWER COMPANY SITE

Potential Pathway	Result	Explanation
Sub-Suface Soil Contact	De-Minimis Exposure	DRO soil contamination remains in the subsurface at the site. BTEX and PAH concentrations are less than direct-contact cleanup levels.
Sub-Suface Soil Ingestion	Exposure Controlled	DRO concentrations exceeding the ingestion cleanup level remain in the subsurface. However, access to the site is controlled.
Inhalation - Outdoor Air	Exposure Controlled	Subsurface soil contamination remains at the site, and DRO concentrations exceed the outdoor-inhalation cleanup level (12,500 mg/kg). However, access to the site is controlled.
Inhalation - Indoor Air	Exposure Controlled	There are currently no structures on the property, but the City of Tanana plans to construct two buildings on the property. Vapor intrusion controls are recommended to reduce or eliminate vapor intrusion into future buildings.
Groundwater Ingestion	Exposure Controlled	DRO soil contamination remains in the subsurface exceeding the migration-to-groundwater cleanup level. However, permafrost is present at depths of 8 feet and greater. Groundwater was encountered at the base of a test pit at depths greater than 24 feet during a 2010 investigation; an alternative point of compliance was established at the edge of the Yukon River. No contamination was detected in pore-water samples from the riverbank in 2012. ADEC must be notified prior to installing wells on the property.
Surface Water Ingestion	Pathway Incomplete	Surface water is located within 100 feet of the property boundary. 2012 groundwater-surface water interface sampling indicated contamination is not migrating to surface water.
Wild Foods Ingestion	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals.
Exposure to Ecological Receptors	De-Minimis Exposure	Remaining soil contamination is primarily in the subsurface at depths greater than 3.5 feet, where exposure to ecological receptors is unlikely.

Notes on Table 3:
"De-minimis exposure" means that, in ADEC's judgment, receptors are unlikely to be aftected by the minimal volume of remaining contamination.
"Pathway incomplete" means that, in ADEC's judgment, contamination has no potential to contact receptors.
"Exposure controlled" means there is an administrative mechanism in place limiting land or groundwater use, or a physical barrier (such as uncontaminated soil) in place that deters contact with residual contamination.

TABLE 4. CUMULATIVE RISK EVALUATION
2014 CORRECTIVE ACTION, FORMER TANANA POWER COMPANY SITE

Analyte Detected at >1/10 of CL	Highest Site Concentration (mg/kg)	Cleanup Level (mg/kg)	1/10 Cleanup Level (mg/kg)
Ethylbenzene	13.1	110	11
Total Xylenes	25.59	63	6.3
1-Methylnaphthalene	46.2	280	28
2-Methylnaphthalene	56.9	280	28
Naphthalene	23.8	28	2.8

Carcinogenic Compounds, Inhalation Pathway

Analyte	Highest Site Concentration (mg/kg)	RBC (mg/kg)	Concentration/RBC
Ethylbenzene	13.1	110	0.12
Naphthalene	23.8	28	0.85
		TOTAL	0.97

Cumulative Risk from Carcinogenic Compounds = Σ[(concentration/RBC) x 10^{-5}]
= 1 x 10^{-5}. DOES NOT EXCEED 1 x 10^{-5}.

Noncarcinogenic Compounds, Direct Contact Pathway

Analyte	Highest Site Concentration (mg/kg)	RBC (mg/kg)	Concentration/RBC
Ethylbenzene	13.1	10,100	0.0013
Total Xylenes	25.59	20,300	0.0013
1-Methylnaphthalene	46.2	280	0.17
2-Methylnaphthalene	56.9	280	0.20
Naphthalene	23.8	1400	0.017
		Subtotal	0.39

Noncarcinogenic Compounds, Inhalation Pathway

Analyte	Highest Site Concentration (mg/kg)	RBC (mg/kg)	Concentration/RBC
Ethylbenzene	13.1	5,100	0.0026
Total Xylenes	25.59	540	0.047
1-Methylnaphthalene	46.2	760	0.061
2-Methylnaphthalene	56.9	750	0.076
Naphthalene	23.8	120	0.20
		Subtotal	0.39
			0.39
			0.39
		TOTAL	0.78

Hazard Index from Noncarcinogenic Compounds = Σ[(concentration/RBC) x 1]
= 0.8. DOES NOT EXCEED 1.

Notes: Only soil concentrations remaining in 2013 and 2014 excavations were evaluated.
CL Cleanup Level; more stringent of 18 AAC 75 Table B1 Direct-Contact or Inhalation Soil-Cleanup Level.
RBC Risk-based concentration.
Results were rounded in accordance with ADEC *Cumulative Risk Guidance* (2008).

APPENDIX A

QUALIFICATIONS OF FIELD PERSONNEL

Jacob Tracy, EIT | Environmental Engineer II

ENVIRONMENTAL

EDUCATION

BS, Civil Engineering, University of Alaska Anchorage, 2012

REGISTRATION

Hazardous Waste Operations & Emergency Response (29 CFR 1910.120)
Engineer in Training, Alaska
Alaska Certified Erosion & Sediment Control Lead (AK-CESCL) Storm Water Training Program
American Red Cross First Aid/CPR training

Jacob Tracy joined Shannon & Wilson in 2012 and is currently an Environmental Engineer II. Jacob's field exploration activities have included soil and groundwater sampling by the Alaska Department of Environmental Conservation (ADEC) Draft Field Sampling Guidance, monitoring well development, sampling, and decommissioning by the ADEC Monitoring Well Guidance, field screening, preliminary site investigations, and database research (municipal, state, and federal). Jacob has prepared technical reports and work plans for a variety of environmental projects. His project work has also included assisting in data management and evaluation using Excel and GIS.

MOA, Underground Storage Tank Fuel Release Emergency Response Plans, Anchorage, Alaska. As a part of this project, Jacob conducted site visits and prepared emergency response plans for eight MOA sites.

ADEC, Former ZipMart Tesoro, Sterling, Alaska. Jacob collected field parameters and groundwater samples from over 20 monitoring wells for the Former ZipMart site. The project includes remedial actions under contract with the ADEC at a UST site with a release of approximately 50,000 gallons of gasoline. Scope has included monitoring/recovery well installation; product and vapor removal pilot testing; product recovery system installation and operation; soil vapor extraction system operation and modification; air sparging system design, installation, and operation; a pilot study with injection of oxygen releasing compound; groundwater sampling; drinking water monitoring; and vapor sampling.

ADEC, Light Plant Former Tank Farm and Former Chefarnmute Corporation Tank Farm, Chefornak, Alaska. Jacob collected soil samples from two leaking underground storage tank sites to evaluate and define the extent of soil contamination associated with the former tank farms. The data collected was used to assess each site's potential eligibility for closure with institutional controls without further remedial action.

ADEC, Glenn Highway Maintenance and Fish & Game Facilities, Glennallen, Alaska. As a part of this site characterization and groundwater investigation, Jacob traveled to the site to assist with soil and drinking water sampling.

North Slope Borough (NSB), South Pad, Barrow, Alaska. Mr. Tracy visited the South Pad site to characterize and map the location of over 500 drums. He also observed the placement of the drums into a containment cell and assisted with the classification of the drum contents. The data gathered was needed to identify appropriate disposal methods and produce a CAP for overall site cleanup.

Holiday Alaska Inc., Groundwater Monitoring, Various Locations, Alaska. Field representative for groundwater monitoring field activities conducted at three Holiday locations. As part of this project, Jacob also conducted drinking water well sampling, well repair, and well decommissioning.

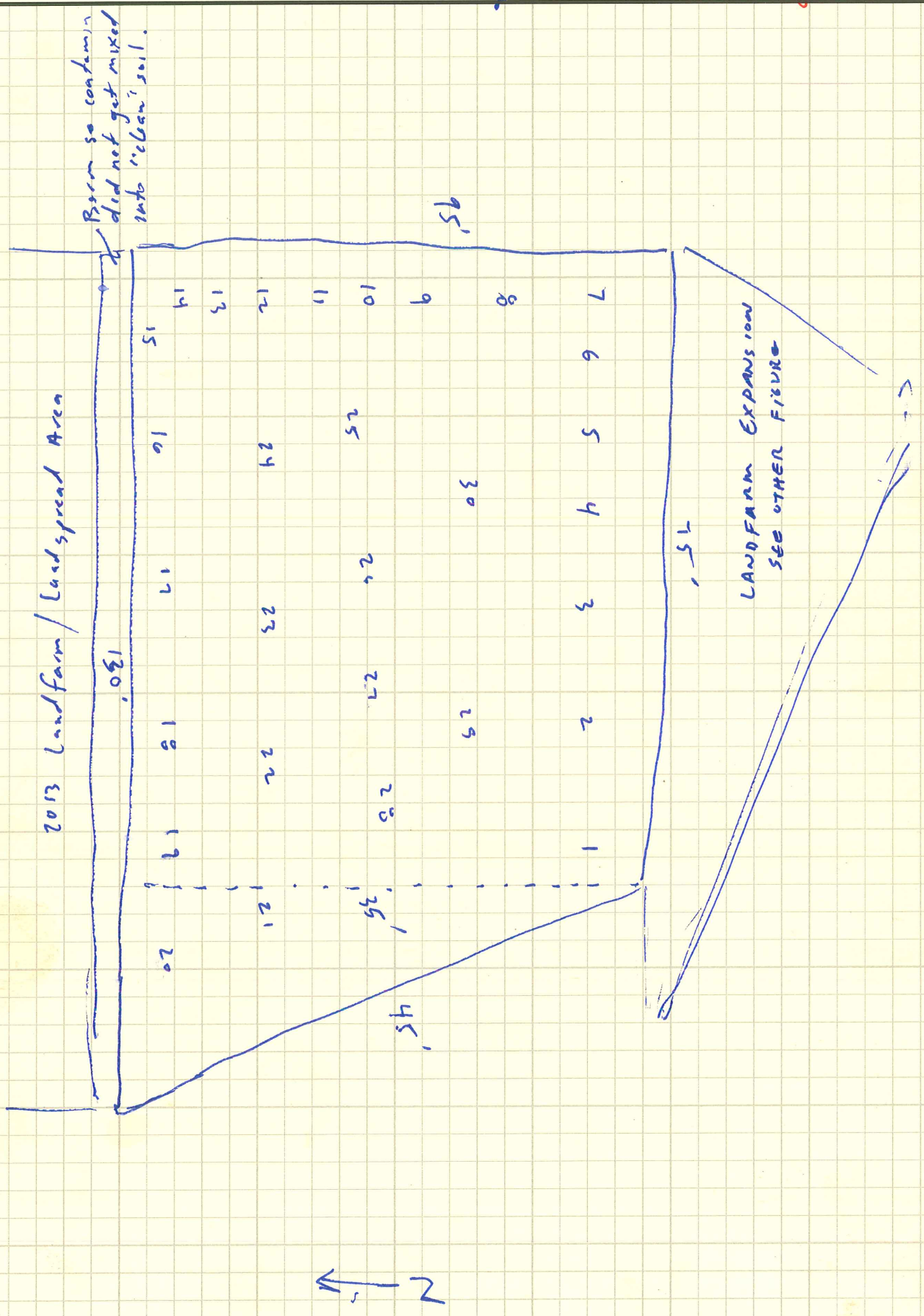
Landfill Water Quality Monitoring Programs, Various Locations, Alaska. Mr. Tracy has performed groundwater sampling at various landfills around the south-central region of Alaska.

APPENDIX B

COPY OF FIELD NOTES

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

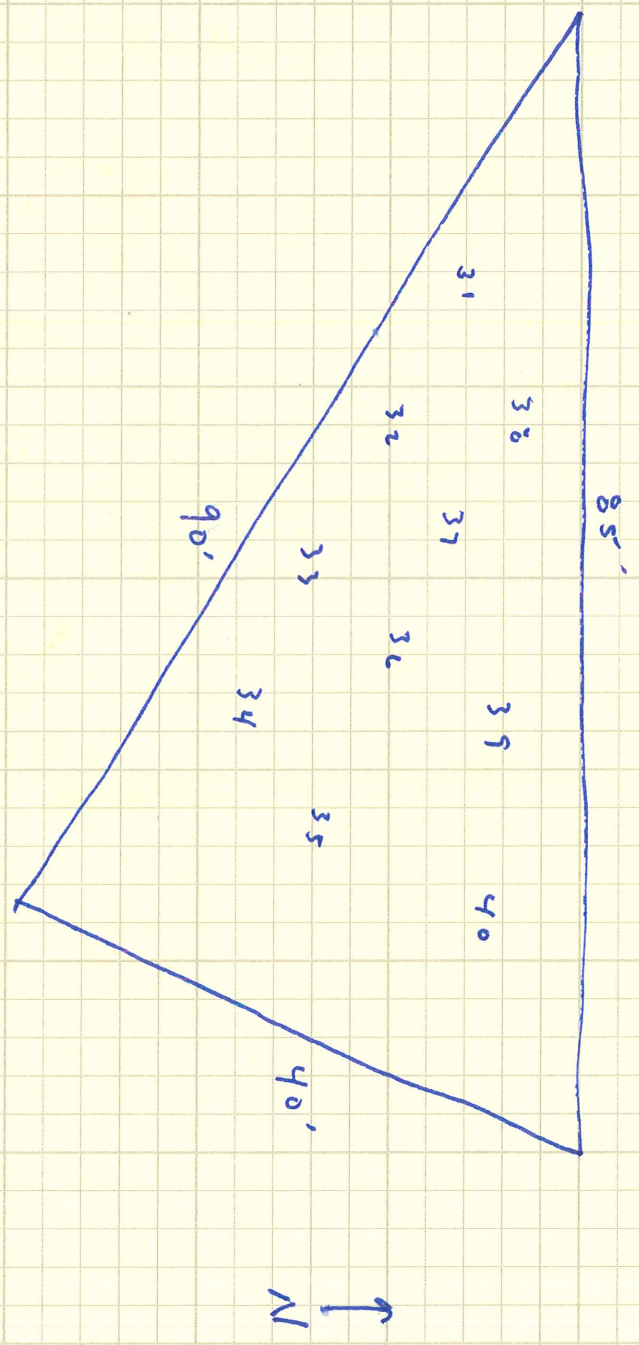
JOB NAME Former Tanana Power JOB NO. 11697-101
SUBJECT Excavations & Sampling DATE 8/26/14
BY Jake Tracy CHK'D SHEET Fig 1 of



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NAME _____ JOB NO. _____
SUBJECT _____ DATE _____
BY _____ CHK'D _____ SHEET Fig 2 of _____

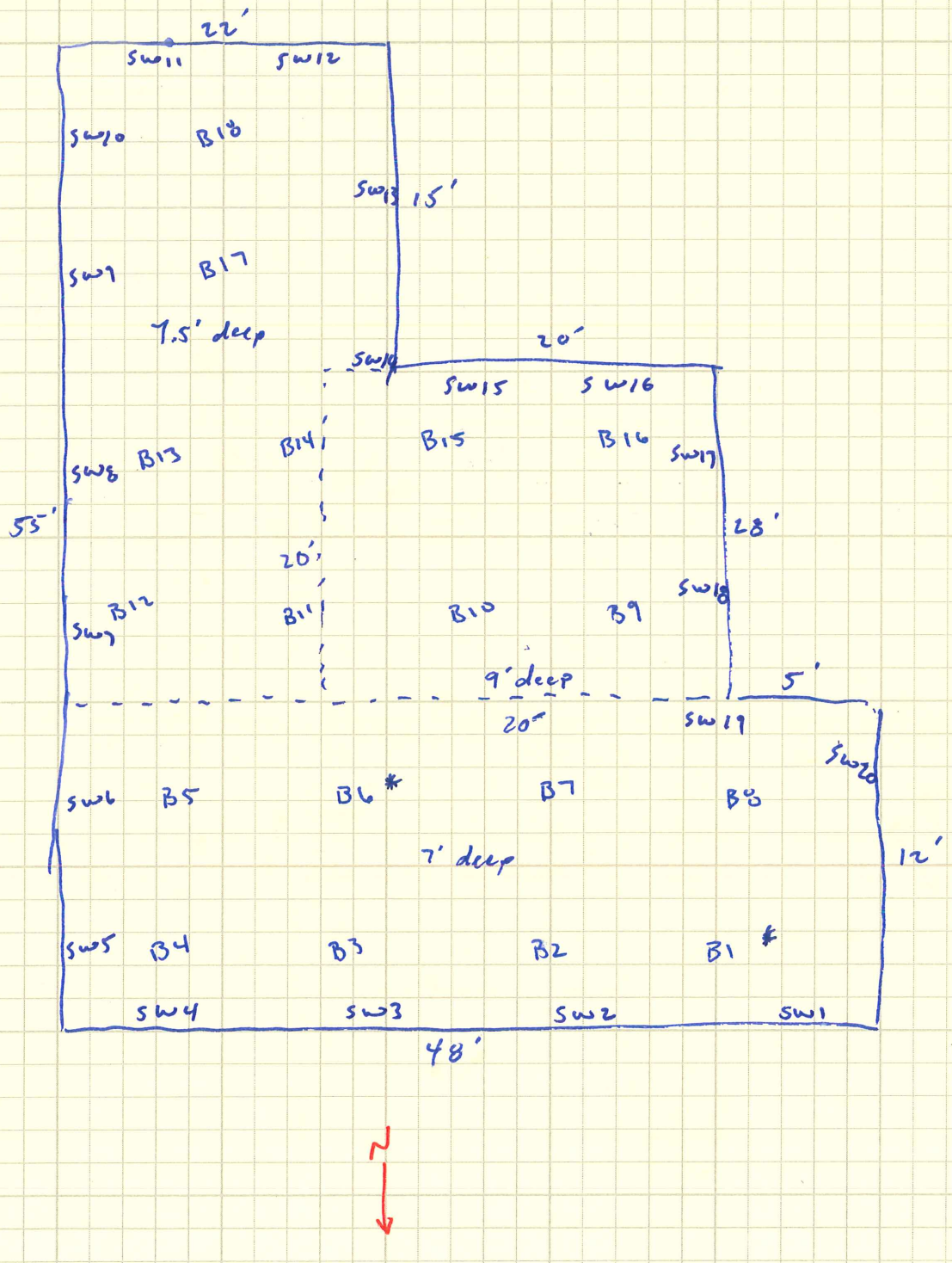
LANDFARM EXPANSION



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NAME _____ JOB NO. _____
SUBJECT _____ DATE _____
BY _____ CHK'D _____ SHEET Fig 3 of _____

Excavation 2

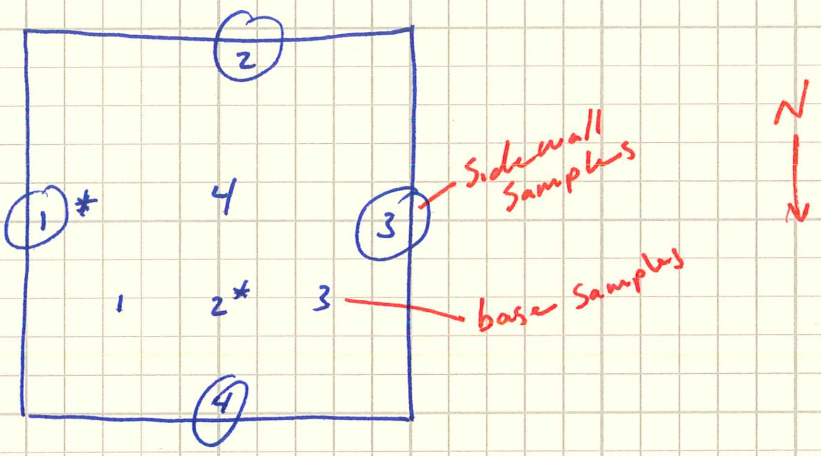


SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NAME Former Tanana Power JOB NO. 11679-101
SUBJECT Excavations & Sampling DATE 8/28/14
BY Jake Tracy CHK'D SHEET Fig 4 of

Excavation 1

7' deep



*: Sample collected for analytical

FIELD SCREENING LOG (soil samples)

Project Number: 11697-101 Project Name: Former Tanana Power Plant

Date: 8/28/14

Sampler: Jake Tracy Calibration time, result: — PID number: —

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
EX2BS01	1330	570	7	Excavation 2 Base FS Sample	Brown to gray, Sandy Silt; moist; HC odor
EX2BS02	1332	350	7		
EX2BS03	1334	340	7		
EX2BS04	1336	430	7		
EX2BS05	1338	460	7		
EX2BS06	1340	620	7		
EX2BS07	1342	470	7		
EX2BS08	1344	350	7		
EX2BS09	1346	130	9		Gray; Gravel with Sand; moist; HC odor
EX2BS10	1348	210	9		
EX2BS11	1350	77	7.5		Brown to gray, Sandy Silt; moist; HC odor
EX2BS12	1352	220	7.5		
EX2BS13	1354	250	7.5		
EX2BS14	1356	42	7.5		
EX2BS15	1358	160	9		Gray; Gravel with Sand; moist; HC odor
EX2BS16	1400	210	9		
EX2BS17	1402	190	7.5		Brown to gray, Sandy Silt; moist; HC odor
EX2BS18	1404	30	7.5		
EX2SW01	1410	0.0	3	Excavation 2 Sidewall FS Sample	Brown to gray, Sandy Silt; moist; HC odor
EX2SW02	1412	0.0	3		
EX2SW03	1414	0.0	4		
EX2SW04	1416	430	3.5		
EX2SW05	1418	410	4		
EX2SW06	1420	360	4		
EX2SW07	1422	190	4.5		
EX2SW08	1424	450	4		
EX2SW09	1426	420	3.5		
EX2SW10	1428	200	3.5		
EX2SW11	1430	22	4		
EX2SW12	1432	0.0	4		
EX2SW13	1434	0.0	4		
EX2SW14	1436	704/10	5		
EX2SW15	1438	25	5		

FIELD SCREENING LOG (soil samples)

Project Number: 11697-101 Project Name: Former Tanana Power Plant

Date: 8/28/14

Sampler: Jake Tracy Calibration time, result: PID number:

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
EX2SW16	1440	110	4	Excavation 2 Sidewall FS Sample	Brown to gray, Sandy Silt; moist; HC odor
EX2SW17	1442	140	4	↓	↓
EX2SW18	1444	110	4.5		
EX2SW19	1446	9.0	4		
EX2SW20	1448	0.0	3.5		
EX1BS01	1615	130	7	Excavation 1 Base FS Sample	Brown, Sandy Silt; moist; HC odor
EX1BS02	1617	160	7	↓	↓
EX1BS03	1619	85	7		
EX1BS04	1621	110	7		
EX1SW01	1623	200	4	Excavation 1 Sidewall FS Sample	Brown, Sandy Silt; moist; HC odor
EX1SW02	1625	25	4	↓	↓
EX1SW03	1627	95	3.5		
EX1SW04	1629	2.0	3.5		
EX2BS51	—	510	7	Duplicate of Sample EX2BS01	Same soil as EX2BS01
EX2BS56	—	620	7	Duplicate of Sample EX2BS06	Same soil as EX2BS06
EX1SW51	—	200	4	Duplicate of Sample EX1SW01	Same soil as EX1SW01

FIELD SCREENING LOG (soil samples)

Project Number: 11697-101 Project Name: Former Tanana Power Plant

Date: 8/26/14 — 8/29/14

Sampler: Jake Tracy Calibration time, result: — PID number: —

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
LFS01	1015	12	0.5-1.5	"Clean" Landfarm Base FS Sample	Brown, Sandy Silt to Silty Sand; with organics; moist; no odor
LFS02	1017	4.5			
LFS03	1019	5.6			
LFS04	1021	4.7			
LFS05	1023	8.7			
LFS06	1025	1.7			
LFS07	1027	7.1			
LFS08	1029	4.2			
LFS09	1031	10.			
LFS10	1033	15			See LFS50 for duplicate info.
LFS11	1035	7.7			
LFS12	1037	9.2			
LFS13	1039	15			
LFS14	1041	11			
8/26 LFS15	1043	8.6			
LFS16	1045	6.7			
LFS17	1047	2.2			
LFS18	1049	1.9			
LFS19	1051	3.2			
LFS20	1053	3.0			
LFS21	1055	9.6			
LFS22	1057	7.1			
LFS23	1059	8.7			
LFS24	1101	8.3			
LFS25	1103	3.6			
LFS26	1105	4.0			
LFS27	1107	9.6			
LFS28	1109	8.1			
LFS29	1111	3.7			
LFS30	1113	4.5			
— LFS31	1000	0.0		"Clean" Landfarm Base FS Sample	Brown, Sandy Silt to Silty Sand; moist; trace organics. Had to expand Landfarm so all 500 cy would fit
LFS32	1002	0.0			
8/28 LFS33	1004	0.0			
LFS34	1006	0.0			

FIELD SCREENING LOG (soil samples)

Project Number: 11697-101 Project Name: Former Tanana Power Plant

Date: 8/26/14 - 8/29/14

Sampler: Jake Tracy Calibration time, result: — PID number: —

	FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
8/28	LFS35	1008	0.0	.5-.75	"Clean" Landfarm Base FS Sample	Brown, Sandy Silt to Silty Sand; moist; trace organics. Had to expand landfarm so all 500 cy would fit.
8/28	LFS36	1010	0.0			
8/28	LFS37	1012	0.0			
8/28	LFS38	1014	0.0			
8/28	LFS39	1016	0.0			
8/28	LFS40	1018	0.0			
		~~1020~~				
8/26	LFS50	~~100~~	15	.5-.75	Duplicate of Sample LFS10	Same soil as LFS10

FIELD SCREENING LOG (soil samples)

Project Number: 11697-101 Project Name: Tenaska Excavation

Date: 8/25/14

Sampler: Jake Tracy Calibration time, result: 1000 ppm = 101 PID number: —

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
LSS01	1000	190	0.5-1	Landspread area (2014) See Figure	Brown to gray, Silty Sand to Sandy Silt moist; hydrocarbon odor. trace organics
02	1002	220			
03	1004	110			
04	1007	280			
05	1012	400			
06	1014	380			
07	1016	690*			Dup LSS57
08	1018	480*			
09	1020	350			
10	1022	310			
11	1024	250			
12	1026	320			
13	1028	190			
14	1030	290			
15	1032	190			
16	1034	210			
17	1036	210			
18	1038	220			
19	1040	270			
20	1042	270			
21	1044	300			
22	1046	330			
23	1048	270			
24	1050	430*			
25	1052	390			
26	1054	290			
27	1056	330			
28	1058	370			
29	1100	340			
30	1102	230			
31	1104	320			
32	1106	350			
33	1108	390*			
34	1110	270			

FIELD SCREENING LOG (soil samples)

Project Number: 11697-101 Project Name: Tanana Excavations

Date: 8/29/14

Sampler: Jake Tracy Calibration time, result: 1000 ppm = 101 PID number: —

FS Sample Number	Sample Time	PID Reading	Depth (ft)	FS Sample Location	Soil Description/Notes
LSS 35	1112	260	0.5-1	2014 Landspreal area. See Figure	Brown to gray, Silty Sand to Sandy Silt moist; hydrocarbon odor; trace organics
36	1114	430*			
37	1116	380			
38	1118	270			
39	1120	310			
40	1122	390			
41	1124	350			
42	1126	320			
43	1128	450*			
44	1130	260			
45	1132	260			
LSS57	—	690	0.5-1	Duplicate of Sample LSS07	Same soil as LSS07

SOIL SAMPLE COLLECTION LOG

Project Number: 11697-101 Project Name: Former Tanana Power Plant

Page 1 of 1

Date: 8/26/14 - 8/29/14

Sampler: Jake Tracy

Sample Number	Location	Sample Time	Depth (ft)	Sample Type	PID Reading	Analyses
8/26	11697-101-LFS01	"Clean" Landfarm Base Sample	1150	0.5	ES	12	
	LFS10	↓	1155	↓	ES	15	
	LFS50	Duplicate of LFS10	1220		Dup.	15	
	LFS13	"Clean" Landfarm Base Sample	1200		ES	15	
	LFS27	↓	1205		ES	9.6	
8/29	LFS31	~~1040~~	~~1040~~		ES	0.0	
	LFS35	~~1045~~	~~1045~~	↓	ES	0.0	
8/28	11697-101-EX2BS01	Excavation 2 Base Sample	1510	7	ES	510	
	EX2BS51	Duplicate of EX2BS01	1540	7	Dup	510	
	EX2BS06	Excavation 2 Base Sample	1515	7	ES	620	
	EX2BS56	Duplicate of EX2BS06	1555	7	Dup	620	
	EX2BS07	Excavation 2 Base Sample	1520	7	ES	470	
	EX2BS13	↓	1525	7.5	ES	250	
	EX2BS16	↓	1530	9	ES	210	
8/28	11697-101-EX2SW04	Excavation 2 Sidewall Sample	1535	3.5	ES	430	
	EX2SW05	↓	1545	4	ES	460	
	EX2SW08	↓	1550	4	ES	450	
	EX2SW09	↓	1600	3.5	ES	420	
	EX2SW17	↓	1605	4	ES	140	
	11697-101-EX1BS02	Excavation 1 Base Sample	1645	7	ES	160	
	EX1SW01	Excavation 1 Sidewall Sample	1650	4	ES	200	
	EX1SW51	Duplicate of EX1SW01	1720	4	Dup	200	
8/29	11697-101-LSS07	Land Spread Sample	1200	0.5	ES	690	
	LSS57	Duplicate of LSS07	1230		Dup	690	
	LSS03	Land Spread Sample	1205		ES	480	
	LSS24	↓	1210		ES	430	
	LSS33	↓	1215		ES	390	
	LSS36	↓	1220		ES	430	
	LSS43	↓	1225	↓	ES	450	

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank

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Geotechnical and Environmental Consultants

JOB NAME Tanana Power JOB NO. 11697-101
SUBJECT Excavations & Soil Sampling DATE 8/25/14
BY JCT CHK'D SHEET 1 of

9w

DAY 1 - TANANA EXCAVATION 55°F Overcast

630: Arrive at AIA for 8:30 departure to Fairbanks

930: Arrive in Fairbanks
Marcy from Fairbanks office picks me up.
Prep equipment and forms at Fairbanks office

1115: Arrive at Wrights Air for 1230 departure to Tanana.

1330: Arrive in Tanana.
The city left a vehicle at airport for my use
Plan to meet with John & Pat to get a plan for tomorrow.
Pat and John think we are excavating more north and west of the proposed excavation. Will ask Julie and ADEC befor diggings.

1430: Drive up to landfarm with John to get an idea of how big we need to extend it.
City has already extended it some but John will make it bigger.

Plan to excavate most contaminated soil from each excavation

1530: Prep materials for landfarm sampling tomorrow.

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Geotechnical and Environmental Consultants

JOB NAME Tanana Power JOB NO. 11697-101
SUBJECT Excavations & Soil Sampling DATE 8/26/14
BY JCT CHK'D SHEET of

8.5

DAY 2 - TANANA EXCAVATION

800: Load gear and mob to site.
Measure landfarm area to make sure it will fit approx 500 cy.

900: Sample landfarm area base. See screening and sample logs for more information.
Called Julie to see how many samples from landfarm. Work plan says 10 but seems excessive. Based on area decided to take 4 plus 1 duplicate.

1130: Start on northern most excavation. Will search for highest ppm and take to landfarm for spreading.

Started in middle of western wall. Hit ppm = 50-100
Begin hauling. Moved north and Hit ppm = 300-600

1200: Lunch

1230: Back on site
Continue loading trucks from excavation 2

1400: Valerie called saying Kristen isn't coming to Tanana anymore. Asked if I would take over field work.

Continued chasing hottest soil in north west corner of Excavation 2. PID hits near 1000 ppm
Asked Marcy in Fairbanks if ok to extend outside of proposed excavation areas. ~~Ok~~
Ok to do so. Try to get hottest soil out.

1700: 27 truck loads total for today.
Trucks are averaging 8cy per load.
For 500cy = 62 trucks.

1730: Unload equipment. Ice samples

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JOB NAME Tanana Power JOB NO. 11697-101
SUBJECT Excavations DATE 8/27/14
BY JCT CHK'D SHEET of

DAY 3: TANANA EXCAVATION

730: Prep equip.
Try to calibrate PID but have two female end fittings for cal gas.
Will have Fairbanks send new one

800: City personnel on site
Move over to Excavation 1. We believe it will be much smaller than two.

Excavate approx. 30 cy of soil from Excavation 1.
Decide to move back to Excavation 2. Hottest soil is in NW corner of Excavation 2.

Some confusion between city/WP/DEC. Pat Moora thought we were digging down 3' and capping it. I was told to chase the contamination and remove hottest soil.
Spoke with SSW and DEC and will continue to get hottest soil out.

1200: Lunch

1230: Call Meghan with DEC and ask if we can stack soil higher if needed.
She said to stick with original plan of 1.5' and extend landfarm where possible.

1500: Finish excavating. Approximately 500 cy ~~was~~ with 65 truck loads total

1530: Mob up to landfarm to extend it so 500cy will fit.

Cal gas and other equipment did not come in today. Should be on morning flight

1700: Finish up at landfarm. Will have an hour more to do in morning.

Everyone more or less on same page now Running smooth. Need cal gas to confirm sampling procedures.

See figures for more information on Excavations and sample locations.

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JOB NAME _____ JOB NO. _____
SUBJECT _____ DATE 8/28/14
BY _____ CHK'D _____ SHEET _____ of _____

DAY 4 - TANANA EXCAVATION

730: Prep equipment and mob to landfarm to observe construction.

~~1000:~~ ~~730:~~ Go to airport to pick up gear.
Pilot says not on plane.
Call Valerie in Fairbanks. Says it will/should be on afternoon flight a 1320.

1200: Finish up landfarm extension.

Lunch. Val says do not have to sample 2013 landspread.

APPENDIX C

SELECTED PROJECT PHOTOGRAPHS

1) Removing additional soil from southwest corner of Excavation 1, facing southeast. August 27, 2014.

2) Removing additional soil from southwest corner of Excavation 1, facing south. August 27, 2014.

3) Locations of samples from additional excavation to Excavation 1, facing northeast. August 29, 2014.

4) Starting additional excavation from northwest corner of Excavation 2, facing southwest. August 27, 2014.

5) Area of additional excvation at northwest corner of Excavation 2, facing northwest. August 27, 2014.

6) Locations of samples from northwest corner of Excavation 2, facing southwest. August 27, 2014.

7) Locations of samples from northwest corner of Excavation 2, facing north. August 27, 2014.

8) Locations of samples from northwest corner of Excavation 2, facing northeast. August 28, 2014.

9) North side of Excavation 2, facing east. August 29, 2014.

10) Landspread contaminated soil in area north of previously (2013) landspread soil, separated by soil berm. August 29, 2014.

APPENDIX D

SGS ANALYTICAL LABORATORY REPORT AND ADEC LABORATORY DATA-REVIEW CHECKLIST

- 1148458

SGS

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
2355 Hill Road
Fairbanks, AK 997095244
(907)479-0600

Report Number: **1148458**

Client Project: **31-1-11697 Tanana Power**

Dear Julie Keener,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Stephen C. Ede
Alaska Division Technical Director

Stephen Ede
2014.09.18
09:23:18 -08'00'

Jennifer Dawkins
Project Manager

Date

Print Date: 09/18/2014 9:01:57AM

Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1148458**
Project Name/Site: **31-1-11697 Tanana Power**
Project Contact: **Julie Keener**

Refer to sample receipt form for information on sample condition.

11697-101-LFS01 (1148458001) PS

AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LFS10 (1148458002) PS

AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LFS50 (1148458003) PS

AK102 - The pattern is consistent with a highly weathered middle distillate.

11697-101-LFS13 (1148458004) PS

AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LFS27 (1148458005) PS

AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2BS01 (1148458008) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2BS51 (1148458009) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2BS06 (1148458010) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.
8270D SIM - Surrogate (2-fluorobippheny) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

11697-101-EX2BS56 (1148458011) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.
8270D SIM - Surrogate (2-fluorobippheny) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

11697-101-EX2BS07 (1148458012) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.
8270D SIM - Surrogate (2-fluorobippheny) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

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Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1148458**
Project Name/Site: **31-1-11697 Tanana Power**
Project Contact: **Julie Keener**

11697-101-EX2BS13 (1148458013) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2BS16 (1148458014) PS

AK101/8021B - Sample cannot be re-analyzed at lower dilution due to non-target analytes with a peak height greater than 6 times the internal standard.
AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2SW04 (1148458015) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2SW05 (1148458016) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2SW08 (1148458017) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2SW09 (1148458018) PS

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX2SW17 (1148458019) PS

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX1BS02 (1148458020) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX1SW01 (1148458021) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-EX1SW51 (1148458022) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LSS07 (1148458023) PS

Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1148458**
Project Name/Site: **31-1-11697 Tanana Power**
Project Contact: **Julie Keener**

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - The pattern is consistent with a weathered middle distillate.
8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

11697-101-LSS57 (1148458024) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.
8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

11697-101-LSS08 (1148458025) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LSS24 (1148458026) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LSS33 (1148458027) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LSS36 (1148458028) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

11697-101-LSS43 (1148458029) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered middle distillate.

1144270001MS (1232040) MS

8270D SIM - MS/MSD recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

1148458026(1232519MS) (1232520) MS

8021B - MS recovery for o-Xylene does not meet QC criteria due to matrix interference. Refer to LCS/LCSD for accuracy.

1144270001MSD (1232041) MSD

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Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1148458**
Project Name/Site: **31-1-11697 Tanana Power**
Project Contact: **Julie Keener**

8270D SIM - MS/MSD recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.
8270D SIM - MS/MSD RPD for benzo(a)pyrene does not meet QC criteria.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

1148458009(1232454MSD) (1232456) MSD

8021B -MSD recovery for O-Xylene does not meet QC criteria due to matrix interference. Refer to LCS/LCSD for accuracy.

1148458026(1232519MSD) (1232521) MSD

8021B - MSD recovery for o-Xylene does not meet QC criteria due to matrix interference. Refer to LCS/LCSD for accuracy.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.
All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
11697-101-LFS01	1148458001	08/26/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LFS10	1148458002	08/26/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LFS50	1148458003	08/26/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LFS13	1148458004	08/26/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LFS27	1148458005	08/26/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LFS31	1148458006	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LFS35	1148458007	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS01	1148458008	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS51	1148458009	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS06	1148458010	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS56	1148458011	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS07	1148458012	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS13	1148458013	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2BS16	1148458014	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2SW04	1148458015	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2SW05	1148458016	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2SW08	1148458017	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2SW09	1148458018	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX2SW17	1148458019	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX1BS02	1148458020	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX1SW01	1148458021	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-EX1SW51	1148458022	08/28/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS07	1148458023	08/29/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS57	1148458024	08/29/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS08	1148458025	08/29/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS24	1148458026	08/29/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS33	1148458027	08/29/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS36	1148458028	08/29/2014	09/05/2014	Soil/Solid (dry weight)
11697-101-LSS43	1148458029	08/29/2014	09/05/2014	Soil/Solid (dry weight)
Trip Blank	1148458030	08/26/2014	09/05/2014	Soil/Solid (dry weight)

Method	Method Description
8270D SIMS (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel Range Organics (S)
SM21 2540G	Percent Solids SM2540G

Detectable Results Summary

Client Sample ID: **11697-101-LFS01**
Lab Sample ID: 1148458001
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	133	mg/Kg

Client Sample ID: **11697-101-LFS10**
Lab Sample ID: 1148458002
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	32.4	mg/Kg

Client Sample ID: **11697-101-LFS50**
Lab Sample ID: 1148458003
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	30.9	mg/Kg

Client Sample ID: **11697-101-LFS13**
Lab Sample ID: 1148458004
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	105	mg/Kg

Client Sample ID: **11697-101-LFS27**
Lab Sample ID: 1148458005
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	138	mg/Kg

Client Sample ID: **11697-101-LFS31**
Lab Sample ID: 1148458006
Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.16J	mg/Kg

Client Sample ID: **11697-101-LFS35**
Lab Sample ID: 1148458007
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	11.9J	mg/Kg
Gasoline Range Organics	1.15J	mg/Kg
o-Xylene	0.0166J	mg/Kg

Client Sample ID: **11697-101-EX2BS01**
Lab Sample ID: 1148458008
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	13900	mg/Kg
Benzene	0.0269	mg/Kg
Ethylbenzene	0.407	mg/Kg
Gasoline Range Organics	147	mg/Kg
o-Xylene	14.0	mg/Kg
P & M -Xylene	5.49	mg/Kg
Toluene	0.105	mg/Kg

Client Sample ID: **11697-101-EX2BS51**
Lab Sample ID: 1148458009
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	11500	mg/Kg
Benzene	0.0349	mg/Kg
Ethylbenzene	0.572	mg/Kg
Gasoline Range Organics	232	mg/Kg
o-Xylene	18.3	mg/Kg
P & M -Xylene	7.29	mg/Kg
Toluene	0.145	mg/Kg

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Detectable Results Summary

Client Sample ID: **11697-101-EX2BS06**
Lab Sample ID: 1148458010

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	46.2	mg/Kg
	2-Methylnaphthalene	51.9	mg/Kg
	Acenaphthene	1.68	mg/Kg
	Anthracene	0.620	mg/Kg
	Fluorene	2.44	mg/Kg
	Naphthalene	20.7	mg/Kg
	Phenanthrene	3.48	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	12000	mg/Kg
Volatile Fuels	Benzene	0.154	mg/Kg
	Ethylbenzene	3.99	mg/Kg
	Gasoline Range Organics	145	mg/Kg
	o-Xylene	5.56	mg/Kg
	P & M -Xylene	6.35	mg/Kg
	Toluene	0.0665	mg/Kg

Client Sample ID: **11697-101-EX2BS56**
Lab Sample ID: 1148458011

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	41.1	mg/Kg
	2-Methylnaphthalene	46.5	mg/Kg
	Acenaphthene	1.52	mg/Kg
	Anthracene	0.525	mg/Kg
	Fluorene	2.18	mg/Kg
	Naphthalene	21.0	mg/Kg
	Phenanthrene	3.16	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	12900	mg/Kg
Volatile Fuels	Benzene	0.108	mg/Kg
	Ethylbenzene	2.71	mg/Kg
	Gasoline Range Organics	93.2	mg/Kg
	o-Xylene	4.37	mg/Kg
	P & M -Xylene	4.32	mg/Kg
	Toluene	0.0421	mg/Kg

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Detectable Results Summary

Client Sample ID: **11697-101-EX2BS07**
Lab Sample ID: 1148458012

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	35.0	mg/Kg
	2-Methylnaphthalene	32.1	mg/Kg
	Acenaphthene	1.55	mg/Kg
	Anthracene	0.456	mg/Kg
	Fluorene	2.21	mg/Kg
	Naphthalene	5.26	mg/Kg
	Phenanthrene	2.82	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	14000	mg/Kg
Volatile Fuels	Benzene	0.189	mg/Kg
	Ethylbenzene	3.18	mg/Kg
	Gasoline Range Organics	95.9	mg/Kg
	o-Xylene	5.84	mg/Kg
	P & M -Xylene	9.96	mg/Kg
	Toluene	0.733	mg/Kg

Client Sample ID: **11697-101-EX2BS13**
Lab Sample ID: 1148458013

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	10800	mg/Kg
Volatile Fuels	Benzene	0.0315	mg/Kg
	Ethylbenzene	3.94	mg/Kg
	Gasoline Range Organics	129	mg/Kg
	o-Xylene	2.39	mg/Kg
	P & M -Xylene	13.4	mg/Kg
	Toluene	0.240	mg/Kg

Client Sample ID: **11697-101-EX2BS16**
Lab Sample ID: 1148458014

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	12400	mg/Kg
Volatile Fuels	Ethylbenzene	0.226	mg/Kg
	Gasoline Range Organics	30.1	mg/Kg
	o-Xylene	0.442	mg/Kg
	P & M -Xylene	0.696	mg/Kg

Client Sample ID: **11697-101-EX2SW04**
Lab Sample ID: 1148458015

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	27700	mg/Kg
Volatile Fuels	Benzene	0.00758J	mg/Kg
	Ethylbenzene	0.232	mg/Kg
	Gasoline Range Organics	267	mg/Kg
	o-Xylene	4.87	mg/Kg
	P & M -Xylene	0.691	mg/Kg
	Toluene	0.0250J	mg/Kg

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Detectable Results Summary

Client Sample ID: **11697-101-EX2SW05**
Lab Sample ID: 1148458016
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	24500	mg/Kg
Benzene	0.00783J	mg/Kg
Ethylbenzene	0.135	mg/Kg
Gasoline Range Organics	56.1	mg/Kg
o-Xylene	1.22	mg/Kg
P & M -Xylene	1.55	mg/Kg
Toluene	0.0160J	mg/Kg

Client Sample ID: **11697-101-EX2SW08**
Lab Sample ID: 1148458017
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	17000	mg/Kg
Benzene	0.0126J	mg/Kg
Ethylbenzene	0.513	mg/Kg
Gasoline Range Organics	177	mg/Kg
o-Xylene	3.34	mg/Kg
P & M -Xylene	0.788	mg/Kg
Toluene	0.0534	mg/Kg

Client Sample ID: **11697-101-EX2SW09**
Lab Sample ID: 1148458018
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	15600	mg/Kg
Ethylbenzene	0.0142J	mg/Kg
Gasoline Range Organics	32.3	mg/Kg
o-Xylene	1.06	mg/Kg
P & M -Xylene	0.283	mg/Kg

Client Sample ID: **11697-101-EX2SW17**
Lab Sample ID: 1148458019
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	12000	mg/Kg
Ethylbenzene	0.0202J	mg/Kg
Gasoline Range Organics	22.0	mg/Kg
o-Xylene	0.701	mg/Kg
P & M -Xylene	0.158	mg/Kg

Client Sample ID: **11697-101-EX1BS02**
Lab Sample ID: 1148458020
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	7270	mg/Kg
Ethylbenzene	0.0911	mg/Kg
Gasoline Range Organics	99.0	mg/Kg
o-Xylene	1.77	mg/Kg
P & M -Xylene	0.503	mg/Kg
Toluene	0.0129J	mg/Kg

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Detectable Results Summary

Client Sample ID: **11697-101-EX1SW01**
Lab Sample ID: 1148458021

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	10400	mg/Kg
Volatile Fuels	Ethylbenzene	0.153	mg/Kg
	Gasoline Range Organics	156	mg/Kg
	o-Xylene	3.00	mg/Kg
	P & M -Xylene	0.839	mg/Kg
	Toluene	0.0282J	mg/Kg

Client Sample ID: **11697-101-EX1SW51**
Lab Sample ID: 1148458022

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	9040	mg/Kg
Volatile Fuels	Ethylbenzene	0.136	mg/Kg
	Gasoline Range Organics	142	mg/Kg
	o-Xylene	2.69	mg/Kg
	P & M -Xylene	0.751	mg/Kg
	Toluene	0.0259J	mg/Kg

Client Sample ID: **11697-101-LSS07**
Lab Sample ID: 1148458023

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	50.7	mg/Kg
	2-Methylnaphthalene	8.40	mg/Kg
	Acenaphthene	2.06	mg/Kg
	Anthracene	0.501J	mg/Kg
	Fluorene	3.05	mg/Kg
	Phenanthrene	3.52	mg/Kg
	Pyrene	0.189J	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	14600	mg/Kg
Volatile Fuels	Benzene	0.0170J	mg/Kg
	Ethylbenzene	1.17	mg/Kg
	Gasoline Range Organics	119	mg/Kg
	o-Xylene	5.36	mg/Kg
	P & M -Xylene	4.89	mg/Kg
	Toluene	0.0494	mg/Kg

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Detectable Results Summary

Client Sample ID: **11697-101-LSS57**
Lab Sample ID: 1148458024

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	59.2	mg/Kg
	2-Methylnaphthalene	8.91	mg/Kg
	Anthracene	0.483J	mg/Kg
	Fluorene	2.92	mg/Kg
	Phenanthrene	3.46	mg/Kg
Semivolatile Organic Fuels	Diesel Range Organics	22400	mg/Kg
Volatile Fuels	Benzene	0.0245	mg/Kg
	Ethylbenzene	1.60	mg/Kg
	Gasoline Range Organics	226	mg/Kg
	o-Xylene	9.44	mg/Kg
	P & M -Xylene	8.46	mg/Kg
	Toluene	0.0852	mg/Kg

Client Sample ID: **11697-101-LSS08**
Lab Sample ID: 1148458025

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	11800	mg/Kg
Volatile Fuels	Ethylbenzene	0.267	mg/Kg
	Gasoline Range Organics	76.3	mg/Kg
	o-Xylene	2.10	mg/Kg
	P & M -Xylene	2.29	mg/Kg
	Toluene	0.0156J	mg/Kg

Client Sample ID: **11697-101-LSS24**
Lab Sample ID: 1148458026

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	13300	mg/Kg
Volatile Fuels	Benzene	0.0257	mg/Kg
	Ethylbenzene	1.83	mg/Kg
	Gasoline Range Organics	193	mg/Kg
	o-Xylene	6.10	mg/Kg
	P & M -Xylene	6.31	mg/Kg
	Toluene	0.0870	mg/Kg

Client Sample ID: **11697-101-LSS33**
Lab Sample ID: 1148458027

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	12200	mg/Kg
Volatile Fuels	Ethylbenzene	0.552	mg/Kg
	Gasoline Range Organics	92.2	mg/Kg
	o-Xylene	1.96	mg/Kg
	P & M -Xylene	2.55	mg/Kg
	Toluene	0.0221J	mg/Kg

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Detectable Results Summary

Client Sample ID: **11697-101-LSS36**
Lab Sample ID: 1148458028
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	14200	mg/Kg
Benzene	0.0130J	mg/Kg
Ethylbenzene	1.18	mg/Kg
Gasoline Range Organics	111	mg/Kg
o-Xylene	3.29	mg/Kg
P & M -Xylene	3.87	mg/Kg
Toluene	0.0400	mg/Kg

Client Sample ID: **11697-101-LSS43**
Lab Sample ID: 1148458029
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	15600	mg/Kg
Ethylbenzene	0.487	mg/Kg
Gasoline Range Organics	133	mg/Kg
o-Xylene	7.21	mg/Kg
P & M -Xylene	4.38	mg/Kg
Toluene	0.0346J	mg/Kg

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Results of **11697-101-LFS01**

Client Sample ID: **11697-101-LFS01**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458001
Lab Project ID: 1148458

Collection Date: 08/26/14 11:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 90.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	133		21.9	6.80	mg/Kg	1		09/08/14 21:25
Surrogates								
5a Androstane	93.1		50-150		%	1		09/08/14 21:25

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 21:25
Container ID: 1148458001-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.113 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LFS01**

Client Sample ID: **11697-101-LFS01**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458001
Lab Project ID: 1148458

Collection Date: 08/26/14 11:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 90.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.55	U	3.11	0.933	mg/Kg	1		09/06/14 00:10
Surrogates								
4-Bromofluorobenzene	89		50-150		%	1		09/06/14 00:10

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/06/14 00:10
Container ID: 1148458001-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 11:50
Prep Initial Wt./Vol.: 52.896 g
Prep Extract Vol: 29.8796 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00780	U	0.0156	0.00498	mg/Kg	1		09/06/14 00:10
Ethylbenzene	0.0156	U	0.0311	0.00971	mg/Kg	1		09/06/14 00:10
o-Xylene	0.0156	U	0.0311	0.00971	mg/Kg	1		09/06/14 00:10
P & M -Xylene	0.0311	U	0.0622	0.0187	mg/Kg	1		09/06/14 00:10
Toluene	0.0156	U	0.0311	0.00971	mg/Kg	1		09/06/14 00:10
Surrogates								
1,4-Difluorobenzene	98.8		72-119		%	1		09/06/14 00:10

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/06/14 00:10
Container ID: 1148458001-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 11:50
Prep Initial Wt./Vol.: 52.896 g
Prep Extract Vol: 29.8796 mL

Results of **11697-101-LFS10**

Client Sample ID: **11697-101-LFS10**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458002
Lab Project ID: 1148458

Collection Date: 08/26/14 11:55
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	32.4		22.5	6.96	mg/Kg	1		09/08/14 21:35
Surrogates								
5a Androstane	95.3		50-150		%	1		09/08/14 21:35

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 21:35
Container ID: 1148458002-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.203 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LFS10**

Client Sample ID: **11697-101-LFS10**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458002
Lab Project ID: 1148458

Collection Date: 08/26/14 11:55
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.60	U	3.19	0.956	mg/Kg	1		09/06/14 00:29
Surrogates								
4-Bromofluorobenzene	89.7		50-150		%	1		09/06/14 00:29

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/06/14 00:29
Container ID: 1148458002-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 11:55
Prep Initial Wt./Vol.: 55.734 g
Prep Extract Vol: 31.4176 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00795	U	0.0159	0.00510	mg/Kg	1		09/06/14 00:29
Ethylbenzene	0.0159	U	0.0319	0.00994	mg/Kg	1		09/06/14 00:29
o-Xylene	0.0159	U	0.0319	0.00994	mg/Kg	1		09/06/14 00:29
P & M -Xylene	0.0319	U	0.0637	0.0191	mg/Kg	1		09/06/14 00:29
Toluene	0.0159	U	0.0319	0.00994	mg/Kg	1		09/06/14 00:29
Surrogates								
1,4-Difluorobenzene	98.4		72-119		%	1		09/06/14 00:29

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/06/14 00:29
Container ID: 1148458002-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 11:55
Prep Initial Wt./Vol.: 55.734 g
Prep Extract Vol: 31.4176 mL

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Results of **11697-101-LFS50**

Client Sample ID: **11697-101-LFS50**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458003
Lab Project ID: 1148458

Collection Date: 08/26/14 12:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	30.9		22.6	7.00	mg/Kg	1		09/08/14 21:45
Surrogates								
5a Androstane	86.8		50-150		%	1		09/08/14 21:45

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 21:45
Container ID: 1148458003-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.058 g
Prep Extract Vol: 1 mL

Print Date: 09/18/2014 9:01:59AM

Results of **11697-101-LFS50**

Client Sample ID: **11697-101-LFS50**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458003
Lab Project ID: 1148458

Collection Date: 08/26/14 12:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.74	U	3.47	1.04	mg/Kg	1		09/05/14 18:11
Surrogates								
4-Bromofluorobenzene	92.7		50-150		%	1		09/05/14 18:11

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/05/14 18:11
Container ID: 1148458003-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 12:20
Prep Initial Wt./Vol.: 50.266 g
Prep Extract Vol: 30.8313 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00865	U	0.0173	0.00555	mg/Kg	1		09/05/14 18:11
Ethylbenzene	0.0174	U	0.0347	0.0108	mg/Kg	1		09/05/14 18:11
o-Xylene	0.0174	U	0.0347	0.0108	mg/Kg	1		09/05/14 18:11
P & M -Xylene	0.0347	U	0.0694	0.0208	mg/Kg	1		09/05/14 18:11
Toluene	0.0174	U	0.0347	0.0108	mg/Kg	1		09/05/14 18:11
Surrogates								
1,4-Difluorobenzene	95.9		72-119		%	1		09/05/14 18:11

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/05/14 18:11
Container ID: 1148458003-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 12:20
Prep Initial Wt./Vol.: 50.266 g
Prep Extract Vol: 30.8313 mL

Results of **11697-101-LFS13**

Client Sample ID: **11697-101-LFS13**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458004
Lab Project ID: 1148458

Collection Date: 08/26/14 12:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 84.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	105		23.3	7.23	mg/Kg	1		09/08/14 21:55
Surrogates								
5a Androstane	90.3		50-150		%	1		09/08/14 21:55

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 21:55
Container ID: 1148458004-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.483 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LFS13**

Client Sample ID: **11697-101-LFS13**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458004
Lab Project ID: 1148458

Collection Date: 08/26/14 12:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 84.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.03	U	4.06	1.22	mg/Kg	1		09/06/14 00:48
Surrogates								
4-Bromofluorobenzene	86.3		50-150		%	1		09/06/14 00:48

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/06/14 00:48
Container ID: 1148458004-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 12:00
Prep Initial Wt./Vol.: 47.122 g
Prep Extract Vol: 32.3319 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0101	U	0.0203	0.00650	mg/Kg	1		09/06/14 00:48
Ethylbenzene	0.0203	U	0.0406	0.0127	mg/Kg	1		09/06/14 00:48
o-Xylene	0.0203	U	0.0406	0.0127	mg/Kg	1		09/06/14 00:48
P & M -Xylene	0.0406	U	0.0813	0.0244	mg/Kg	1		09/06/14 00:48
Toluene	0.0203	U	0.0406	0.0127	mg/Kg	1		09/06/14 00:48
Surrogates								
1,4-Difluorobenzene	96.6		72-119		%	1		09/06/14 00:48

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/06/14 00:48
Container ID: 1148458004-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 12:00
Prep Initial Wt./Vol.: 47.122 g
Prep Extract Vol: 32.3319 mL

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Results of **11697-101-LFS27**

Client Sample ID: **11697-101-LFS27**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458005
Lab Project ID: 1148458

Collection Date: 08/26/14 12:05
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	138		22.6	7.00	mg/Kg	1		09/08/14 22:04
Surrogates								
5a Androstane	93.2		50-150		%	1		09/08/14 22:04

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 22:04
Container ID: 1148458005-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.046 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LFS27**

Client Sample ID: **11697-101-LFS27**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458005
Lab Project ID: 1148458

Collection Date: 08/26/14 12:05
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.76	U	3.53	1.06	mg/Kg	1		09/06/14 01:06
Surrogates								
4-Bromofluorobenzene	87.1		50-150		%	1		09/06/14 01:06

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/06/14 01:06
Container ID: 1148458005-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 12:05
Prep Initial Wt./Vol.: 49.216 g
Prep Extract Vol: 30.6964 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00880	U	0.0176	0.00564	mg/Kg	1		09/06/14 01:06
Ethylbenzene	0.0176	U	0.0353	0.0110	mg/Kg	1		09/06/14 01:06
o-Xylene	0.0176	U	0.0353	0.0110	mg/Kg	1		09/06/14 01:06
P & M -Xylene	0.0352	U	0.0705	0.0212	mg/Kg	1		09/06/14 01:06
Toluene	0.0176	U	0.0353	0.0110	mg/Kg	1		09/06/14 01:06
Surrogates								
1,4-Difluorobenzene	97.4		72-119		%	1		09/06/14 01:06

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/06/14 01:06
Container ID: 1148458005-B

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 12:05
Prep Initial Wt./Vol.: 49.216 g
Prep Extract Vol: 30.6964 mL

Results of **11697-101-LFS31**

Client Sample ID: **11697-101-LFS31**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458006
Lab Project ID: 1148458

Collection Date: 08/28/14 10:40
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 92.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10.8	U	21.5	6.65	mg/Kg	1		09/08/14 22:14
Surrogates								
5a Androstane	90.2		50-150		%	1		09/08/14 22:14

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 22:14
Container ID: 1148458006-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.1 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LFS31**

Client Sample ID: **11697-101-LFS31**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458006
Lab Project ID: 1148458

Collection Date: 08/28/14 10:40
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 92.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.16	J	3.02	0.907	mg/Kg	1		09/08/14 16:59
Surrogates								
4-Bromofluorobenzene	92.8		50-150		%	1		09/08/14 16:59

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 16:59
Container ID: 1148458006-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 10:40
Prep Initial Wt./Vol.: 50.935 g
Prep Extract Vol: 28.6085 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00755	U	0.0151	0.00484	mg/Kg	1		09/08/14 16:59
Ethylbenzene	0.0151	U	0.0302	0.00943	mg/Kg	1		09/08/14 16:59
o-Xylene	0.0151	U	0.0302	0.00943	mg/Kg	1		09/08/14 16:59
P & M -Xylene	0.0302	U	0.0604	0.0181	mg/Kg	1		09/08/14 16:59
Toluene	0.0151	U	0.0302	0.00943	mg/Kg	1		09/08/14 16:59
Surrogates								
1,4-Difluorobenzene	97.5		72-119		%	1		09/08/14 16:59

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 16:59
Container ID: 1148458006-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 10:40
Prep Initial Wt./Vol.: 50.935 g
Prep Extract Vol: 28.6085 mL

Results of **11697-101-LFS35**

Client Sample ID: **11697-101-LFS35**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458007
Lab Project ID: 1148458

Collection Date: 08/28/14 10:45
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 91.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.9	J	21.8	6.77	mg/Kg	1		09/08/14 22:24
Surrogates								
5a Androstane	92.8		50-150		%	1		09/08/14 22:24

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/08/14 22:24
Container ID: 1148458007-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.029 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LFS35**

Client Sample ID: **11697-101-LFS35**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458007
Lab Project ID: 1148458

Collection Date: 08/28/14 10:45
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 91.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.15	J	3.25	0.974	mg/Kg	1		09/08/14 13:30
Surrogates								
4-Bromofluorobenzene	103		50-150		%	1		09/08/14 13:30

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 13:30
Container ID: 1148458007-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 10:45
Prep Initial Wt./Vol.: 49.115 g
Prep Extract Vol: 29.179 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00810	U	0.0162	0.00519	mg/Kg	1		09/08/14 13:30
Ethylbenzene	0.0163	U	0.0325	0.0101	mg/Kg	1		09/08/14 13:30
o-Xylene	0.0166	J	0.0325	0.0101	mg/Kg	1		09/08/14 13:30
P & M -Xylene	0.0325	U	0.0649	0.0195	mg/Kg	1		09/08/14 13:30
Toluene	0.0163	U	0.0325	0.0101	mg/Kg	1		09/08/14 13:30
Surrogates								
1,4-Difluorobenzene	93.2		72-119		%	1		09/08/14 13:30

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 13:30
Container ID: 1148458007-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 10:45
Prep Initial Wt./Vol.: 49.115 g
Prep Extract Vol: 29.179 mL

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Results of **11697-101-EX2BS01**

Client Sample ID: **11697-101-EX2BS01**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458008
Lab Project ID: 1148458

Collection Date: 08/28/14 15:10
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 80.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13900		1250	386	mg/Kg	50		09/09/14 23:10
Surrogates								
5a Androstane	0	*	50-150		%	50		09/09/14 23:10

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 23:10
Container ID: 1148458008-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.033 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS01**

Client Sample ID: **11697-101-EX2BS01**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458008
Lab Project ID: 1148458

Collection Date: 08/28/14 15:10
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 80.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	147		3.74	1.12	mg/Kg	1		09/08/14 13:49
Surrogates								
4-Bromofluorobenzene	857	*	50-150		%	1		09/08/14 13:49

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 13:49
Container ID: 1148458008-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:10
Prep Initial Wt./Vol.: 62.312 g
Prep Extract Vol: 37.3517 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0269		0.0187	0.00598	mg/Kg	1		09/08/14 13:49
Ethylbenzene	0.407		0.0374	0.0117	mg/Kg	1		09/08/14 13:49
o-Xylene	14.0		0.374	0.117	mg/Kg	10		09/08/14 17:18
P & M -Xylene	5.49		0.748	0.224	mg/Kg	10		09/08/14 17:18
Toluene	0.105		0.0374	0.0117	mg/Kg	1		09/08/14 13:49
Surrogates								
1,4-Difluorobenzene	104		72-119		%	1		09/08/14 13:49

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 13:49
Container ID: 1148458008-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:10
Prep Initial Wt./Vol.: 62.312 g
Prep Extract Vol: 37.3517 mL

Results of **11697-101-EX2BS51**

Client Sample ID: **11697-101-EX2BS51**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458009
Lab Project ID: 1148458

Collection Date: 08/28/14 15:40
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 79.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11500		1250	388	mg/Kg	50		09/09/14 23:19
Surrogates								
5a Androstane	0	*	50-150		%	50		09/09/14 23:19

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 23:19
Container ID: 1148458009-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.025 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS51**

Client Sample ID: **11697-101-EX2BS51**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458009
Lab Project ID: 1148458

Collection Date: 08/28/14 15:40
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 79.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	232		44.8	13.4	mg/Kg	10		09/08/14 17:37
Surrogates								
4-Bromofluorobenzene	1030	*	50-150		%	10		09/08/14 17:37

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 17:37
Container ID: 1148458009-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:40
Prep Initial Wt./Vol.: 48.611 g
Prep Extract Vol: 34.7843 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0349		0.0224	0.00717	mg/Kg	1		09/08/14 11:55
Ethylbenzene	0.572		0.0448	0.0140	mg/Kg	1		09/08/14 11:55
o-Xylene	18.3		0.448	0.140	mg/Kg	10		09/08/14 17:37
P & M -Xylene	7.29		0.896	0.269	mg/Kg	10		09/08/14 17:37
Toluene	0.145		0.0448	0.0140	mg/Kg	1		09/08/14 11:55
Surrogates								
1,4-Difluorobenzene	106		72-119		%	1		09/08/14 11:55

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 11:55
Container ID: 1148458009-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:40
Prep Initial Wt./Vol.: 48.611 g
Prep Extract Vol: 34.7843 mL

Results of **11697-101-EX2BS06**

Client Sample ID: **11697-101-EX2BS06**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458010
Lab Project ID: 1148458

Collection Date: 08/28/14 15:15
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 77.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	46.2		3.24	0.973	mg/Kg	500		09/15/14 16:57
2-Methylnaphthalene	51.9		3.24	0.973	mg/Kg	500		09/15/14 16:57
Acenaphthene	1.68		0.324	0.0973	mg/Kg	50		09/11/14 20:32
Acenaphthylene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Anthracene	0.620		0.324	0.0973	mg/Kg	50		09/11/14 20:32
Benzo(a)Anthracene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Benzo[a]pyrene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Benzo[b]Fluoranthene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Benzo[g,h,i]perylene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Benzo[k]fluoranthene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Chrysene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Dibenzo[a,h]anthracene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Fluoranthene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Fluorene	2.44		0.324	0.0973	mg/Kg	50		09/11/14 20:32
Indeno[1,2,3-c,d] pyrene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Naphthalene	20.7		3.24	0.973	mg/Kg	500		09/15/14 16:57
Phenanthrene	3.48		0.324	0.0973	mg/Kg	50		09/11/14 20:32
Pyrene	0.162	U	0.324	0.0973	mg/Kg	50		09/11/14 20:32
Surrogates								
2-Fluorobiphenyl	139	*	45-105		%	50		09/11/14 20:32
Terphenyl-d14	102		30-125		%	50		09/11/14 20:32

Batch Information

Analytical Batch: XMS8280
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/11/14 20:32
Container ID: 1148458010-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.527 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8286
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/15/14 16:57
Container ID: 1148458010-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.527 g
Prep Extract Vol: 1 mL

Results of **11697-101-EX2BS06**

Client Sample ID: **11697-101-EX2BS06**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458010
Lab Project ID: 1148458

Collection Date: 08/28/14 15:15
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 77.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12000		1300	402	mg/Kg	50		09/09/14 23:29
Surrogates								
5a Androstane	0	*	50-150		%	50		09/09/14 23:29

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 23:29
Container ID: 1148458010-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.035 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS06**

Client Sample ID: **11697-101-EX2BS06**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458010
Lab Project ID: 1148458

Collection Date: 08/28/14 15:15
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 77.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	145		3.98	1.19	mg/Kg	1		09/08/14 14:08
Surrogates								
4-Bromofluorobenzene	1080	*	50-150		%	1		09/08/14 14:08

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 14:08
Container ID: 1148458010-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:15
Prep Initial Wt./Vol.: 65.279 g
Prep Extract Vol: 40.0295 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.154		0.0199	0.00637	mg/Kg	1		09/08/14 14:08
Ethylbenzene	3.99		0.0398	0.0124	mg/Kg	1		09/08/14 14:08
o-Xylene	5.56		0.0398	0.0124	mg/Kg	1		09/08/14 14:08
P & M -Xylene	6.35		0.0797	0.0239	mg/Kg	1		09/08/14 14:08
Toluene	0.0665		0.0398	0.0124	mg/Kg	1		09/08/14 14:08
Surrogates								
1,4-Difluorobenzene	106		72-119		%	1		09/08/14 14:08

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 14:08
Container ID: 1148458010-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:15
Prep Initial Wt./Vol.: 65.279 g
Prep Extract Vol: 40.0295 mL

Results of **11697-101-EX2BS56**

Client Sample ID: **11697-101-EX2BS56**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458011
Lab Project ID: 1148458

Collection Date: 08/28/14 15:55
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 76.7
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	41.1		3.25	0.974	mg/Kg	500		09/16/14 11:48
2-Methylnaphthalene	46.5		3.25	0.974	mg/Kg	500		09/16/14 11:48
Acenaphthene	1.52		0.325	0.0974	mg/Kg	50		09/11/14 20:48
Acenaphthylene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Anthracene	0.525		0.325	0.0974	mg/Kg	50		09/11/14 20:48
Benzo(a)Anthracene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Benzo[a]pyrene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Benzo[b]Fluoranthene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Benzo[g,h,i]perylene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Benzo[k]fluoranthene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Chrysene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Dibenzo[a,h]anthracene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Fluoranthene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Fluorene	2.18		0.325	0.0974	mg/Kg	50		09/11/14 20:48
Indeno[1,2,3-c,d] pyrene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Naphthalene	21.0		3.25	0.974	mg/Kg	500		09/16/14 11:48
Phenanthrene	3.16		0.325	0.0974	mg/Kg	50		09/11/14 20:48
Pyrene	0.163	U	0.325	0.0974	mg/Kg	50		09/11/14 20:48
Surrogates								
2-Fluorobiphenyl	143	*	45-105		%	50		09/11/14 20:48
Terphenyl-d14	98.9		30-125		%	50		09/11/14 20:48

Batch Information

Analytical Batch: XMS8280
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/11/14 20:48
Container ID: 1148458011-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.594 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8289
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/16/14 11:48
Container ID: 1148458011-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.594 g
Prep Extract Vol: 1 mL

Results of **11697-101-EX2BS56**

Client Sample ID: **11697-101-EX2BS56**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458011
Lab Project ID: 1148458

Collection Date: 08/28/14 15:55
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 76.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12900		1300	403	mg/Kg	50		09/09/14 23:39
Surrogates								
5a Androstane	0	*	50-150		%	50		09/09/14 23:39

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 23:39
Container ID: 1148458011-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.127 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS56**

Client Sample ID: **11697-101-EX2BS56**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458011
Lab Project ID: 1148458

Collection Date: 08/28/14 15:55
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 76.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	93.2		3.59	1.08	mg/Kg	1		09/08/14 14:27
Surrogates								
4-Bromofluorobenzene	837	*	50-150		%	1		09/08/14 14:27

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 14:27
Container ID: 1148458011-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:55
Prep Initial Wt./Vol.: 78.577 g
Prep Extract Vol: 43.316 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.108		0.0180	0.00575	mg/Kg	1		09/08/14 14:27
Ethylbenzene	2.71		0.0359	0.0112	mg/Kg	1		09/08/14 14:27
o-Xylene	4.37		0.0359	0.0112	mg/Kg	1		09/08/14 14:27
P & M -Xylene	4.32		0.0719	0.0216	mg/Kg	1		09/08/14 14:27
Toluene	0.0421		0.0359	0.0112	mg/Kg	1		09/08/14 14:27
Surrogates								
1,4-Difluorobenzene	105		72-119		%	1		09/08/14 14:27

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 14:27
Container ID: 1148458011-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:55
Prep Initial Wt./Vol.: 78.577 g
Prep Extract Vol: 43.316 mL

Results of **11697-101-EX2BS07**

Client Sample ID: **11697-101-EX2BS07**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458012
Lab Project ID: 1148458

Collection Date: 08/28/14 15:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 79.4
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	35.0		3.12	0.937	mg/Kg	500		09/16/14 12:05
2-Methylnaphthalene	32.1		3.12	0.937	mg/Kg	500		09/16/14 12:05
Acenaphthene	1.55		0.312	0.0937	mg/Kg	50		09/11/14 21:05
Acenaphthylene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Anthracene	0.456		0.312	0.0937	mg/Kg	50		09/11/14 21:05
Benzo(a)Anthracene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Benzo[a]pyrene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Benzo[b]Fluoranthene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Benzo[g,h,i]perylene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Benzo[k]fluoranthene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Chrysene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Dibenzo[a,h]anthracene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Fluoranthene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Fluorene	2.21		0.312	0.0937	mg/Kg	50		09/11/14 21:05
Indeno[1,2,3-c,d] pyrene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Naphthalene	5.26		0.312	0.0937	mg/Kg	50		09/11/14 21:05
Phenanthrene	2.82		0.312	0.0937	mg/Kg	50		09/11/14 21:05
Pyrene	0.156	U	0.312	0.0937	mg/Kg	50		09/11/14 21:05
Surrogates								
2-Fluorobiphenyl	1370	*	45-105		%	50		09/11/14 21:05
Terphenyl-d14	101		30-125		%	50		09/11/14 21:05

Batch Information

Analytical Batch: XMS8280
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/11/14 21:05
Container ID: 1148458012-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.686 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8289
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/16/14 12:05
Container ID: 1148458012-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.686 g
Prep Extract Vol: 1 mL

Print Date: 09/18/2014 9:01:59AM

Results of **11697-101-EX2BS07**

Client Sample ID: **11697-101-EX2BS07**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458012
Lab Project ID: 1148458

Collection Date: 08/28/14 15:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 79.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14000		1250	388	mg/Kg	50		09/09/14 23:58
Surrogates								
5a Androstane	0	*	50-150		%	50		09/09/14 23:58

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 23:58
Container ID: 1148458012-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.2 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS07**

Client Sample ID: **11697-101-EX2BS07**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458012
Lab Project ID: 1148458

Collection Date: 08/28/14 15:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 79.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	95.9		7.17	2.15	mg/Kg	2		09/08/14 15:43
Surrogates								
4-Bromofluorobenzene	618	*	50-150		%	2		09/08/14 15:43

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 15:43
Container ID: 1148458012-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:20
Prep Initial Wt./Vol.: 68.824 g
Prep Extract Vol: 39.1835 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.189		0.0359	0.0115	mg/Kg	2		09/08/14 15:43
Ethylbenzene	3.18		0.0717	0.0224	mg/Kg	2		09/08/14 15:43
o-Xylene	5.84		0.0717	0.0224	mg/Kg	2		09/08/14 15:43
P & M -Xylene	9.96		0.143	0.0430	mg/Kg	2		09/08/14 15:43
Toluene	0.733		0.0717	0.0224	mg/Kg	2		09/08/14 15:43
Surrogates								
1,4-Difluorobenzene	103		72-119		%	2		09/08/14 15:43

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 15:43
Container ID: 1148458012-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:20
Prep Initial Wt./Vol.: 68.824 g
Prep Extract Vol: 39.1835 mL

Results of **11697-101-EX2BS13**

Client Sample ID: **11697-101-EX2BS13**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458013
Lab Project ID: 1148458

Collection Date: 08/28/14 15:25
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 85.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10800		1170	364	mg/Kg	50		09/10/14 00:08
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 00:08

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 00:08
Container ID: 1148458013-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.062 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS13**

Client Sample ID: **11697-101-EX2BS13**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458013
Lab Project ID: 1148458

Collection Date: 08/28/14 15:25
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 85.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	129		28.1	8.44	mg/Kg	10		09/08/14 17:56
Surrogates								
4-Bromofluorobenzene	1030	*	50-150		%	10		09/08/14 17:56

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 17:56
Container ID: 1148458013-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:25
Prep Initial Wt./Vol.: 75.92 g
Prep Extract Vol: 36.342 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0315		0.0141	0.00450	mg/Kg	1		09/08/14 14:46
Ethylbenzene	3.94		0.0281	0.00878	mg/Kg	1		09/08/14 14:46
o-Xylene	2.39		0.0281	0.00878	mg/Kg	1		09/08/14 14:46
P & M -Xylene	13.4		0.0563	0.0169	mg/Kg	1		09/08/14 14:46
Toluene	0.240		0.0281	0.00878	mg/Kg	1		09/08/14 14:46
Surrogates								
1,4-Difluorobenzene	106		72-119		%	1		09/08/14 14:46

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 14:46
Container ID: 1148458013-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:25
Prep Initial Wt./Vol.: 75.92 g
Prep Extract Vol: 36.342 mL

Results of **11697-101-EX2BS16**

Client Sample ID: **11697-101-EX2BS16**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458014
Lab Project ID: 1148458

Collection Date: 08/28/14 15:30
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 84.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12400		1170	362	mg/Kg	50		09/10/14 00:18
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 00:18

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 00:18
Container ID: 1148458014-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.277 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2BS16**

Client Sample ID: **11697-101-EX2BS16**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458014
Lab Project ID: 1148458

Collection Date: 08/28/14 15:30
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 84.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	30.1		5.33	1.60	mg/Kg	2		09/08/14 20:49
Surrogates								
4-Bromofluorobenzene	272	*	50-150		%	2		09/08/14 20:49

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 20:49
Container ID: 1148458014-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:30
Prep Initial Wt./Vol.: 82.891 g
Prep Extract Vol: 37.4894 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0133	U	0.0266	0.00852	mg/Kg	2		09/08/14 20:49
Ethylbenzene	0.226		0.0533	0.0166	mg/Kg	2		09/08/14 20:49
o-Xylene	0.442		0.0533	0.0166	mg/Kg	2		09/08/14 20:49
P & M -Xylene	0.696		0.107	0.0320	mg/Kg	2		09/08/14 20:49
Toluene	0.0267	U	0.0533	0.0166	mg/Kg	2		09/08/14 20:49
Surrogates								
1,4-Difluorobenzene	102		72-119		%	2		09/08/14 20:49

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 20:49
Container ID: 1148458014-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:30
Prep Initial Wt./Vol.: 82.891 g
Prep Extract Vol: 37.4894 mL

Results of **11697-101-EX2SW04**

Client Sample ID: **11697-101-EX2SW04**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458015
Lab Project ID: 1148458

Collection Date: 08/28/14 15:35
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	27700		1130	349	mg/Kg	50		09/10/14 00:28
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 00:28

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 00:28
Container ID: 1148458015-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.098 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2SW04**

Client Sample ID: **11697-101-EX2SW04**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458015
Lab Project ID: 1148458

Collection Date: 08/28/14 15:35
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 88.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	267		37.9	11.4	mg/Kg	10		09/08/14 18:15
Surrogates								
4-Bromofluorobenzene	851	*	50-150		%	10		09/08/14 18:15

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 18:15
Container ID: 1148458015-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:35
Prep Initial Wt./Vol.: 45.083 g
Prep Extract Vol: 30.2202 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00758	J	0.0190	0.00606	mg/Kg	1		09/08/14 15:05
Ethylbenzene	0.232		0.0379	0.0118	mg/Kg	1		09/08/14 15:05
o-Xylene	4.87		0.0379	0.0118	mg/Kg	1		09/08/14 15:05
P & M -Xylene	0.691		0.0758	0.0227	mg/Kg	1		09/08/14 15:05
Toluene	0.0250	J	0.0379	0.0118	mg/Kg	1		09/08/14 15:05
Surrogates								
1,4-Difluorobenzene	103		72-119		%	1		09/08/14 15:05

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 15:05
Container ID: 1148458015-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:35
Prep Initial Wt./Vol.: 45.083 g
Prep Extract Vol: 30.2202 mL

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Results of **11697-101-EX2SW05**

Client Sample ID: **11697-101-EX2SW05**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458016
Lab Project ID: 1148458

Collection Date: 08/28/14 15:45
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	24500		1190	370	mg/Kg	50		09/10/14 00:38
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 00:38

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 00:38
Container ID: 1148458016-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.104 g
Prep Extract Vol: 1 mL

Print Date: 09/18/2014 9:01:59AM

Results of **11697-101-EX2SW05**

Client Sample ID: **11697-101-EX2SW05**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458016
Lab Project ID: 1148458

Collection Date: 08/28/14 15:45
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	56.1		3.56	1.07	mg/Kg	1		09/08/14 15:24
Surrogates								
4-Bromofluorobenzene	416	*	50-150		%	1		09/08/14 15:24

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 15:24
Container ID: 1148458016-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:45
Prep Initial Wt./Vol.: 58.24 g
Prep Extract Vol: 34.6006 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00783	J	0.0178	0.00569	mg/Kg	1		09/08/14 15:24
Ethylbenzene	0.135		0.0356	0.0111	mg/Kg	1		09/08/14 15:24
o-Xylene	1.22		0.0356	0.0111	mg/Kg	1		09/08/14 15:24
P & M -Xylene	1.55		0.0711	0.0213	mg/Kg	1		09/08/14 15:24
Toluene	0.0160	J	0.0356	0.0111	mg/Kg	1		09/08/14 15:24
Surrogates								
1,4-Difluorobenzene	104		72-119		%	1		09/08/14 15:24

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 15:24
Container ID: 1148458016-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:45
Prep Initial Wt./Vol.: 58.24 g
Prep Extract Vol: 34.6006 mL

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Results of **11697-101-EX2SW08**

Client Sample ID: **11697-101-EX2SW08**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458017
Lab Project ID: 1148458

Collection Date: 08/28/14 15:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 82.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	17000		1190	369	mg/Kg	50		09/10/14 00:57
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 00:57

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 00:57
Container ID: 1148458017-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.394 g
Prep Extract Vol: 1 mL

Print Date: 09/18/2014 9:01:59AM

Results of **11697-101-EX2SW08**

Client Sample ID: **11697-101-EX2SW08**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458017
Lab Project ID: 1148458

Collection Date: 08/28/14 15:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 82.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	177		43.4	13.0	mg/Kg	10		09/09/14 16:35
Surrogates								
4-Bromofluorobenzene	680	*	50-150		%	10		09/09/14 16:35

Batch Information

Analytical Batch: VFC12098
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/09/14 16:35
Container ID: 1148458017-B

Prep Batch: VXX26417
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:50
Prep Initial Wt./Vol.: 45.608 g
Prep Extract Vol: 32.8183 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0126	J	0.0217	0.00695	mg/Kg	1		09/08/14 19:31
Ethylbenzene	0.513		0.0434	0.0135	mg/Kg	1		09/08/14 19:31
o-Xylene	3.34		0.0434	0.0135	mg/Kg	1		09/08/14 19:31
P & M -Xylene	0.788		0.0868	0.0261	mg/Kg	1		09/08/14 19:31
Toluene	0.0534		0.0434	0.0135	mg/Kg	1		09/08/14 19:31
Surrogates								
1,4-Difluorobenzene	106		72-119		%	1		09/08/14 19:31

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 19:31
Container ID: 1148458017-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 15:50
Prep Initial Wt./Vol.: 45.608 g
Prep Extract Vol: 32.8183 mL

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Results of **11697-101-EX2SW09**

Client Sample ID: **11697-101-EX2SW09**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458018
Lab Project ID: 1148458

Collection Date: 08/28/14 16:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	15600		1220	379	mg/Kg	50		09/10/14 01:07
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 01:07

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 01:07
Container ID: 1148458018-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.202 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2SW09**

Client Sample ID: **11697-101-EX2SW09**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458018
Lab Project ID: 1148458

Collection Date: 08/28/14 16:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	32.3		4.17	1.25	mg/Kg	1		09/08/14 19:50
Surrogates								
4-Bromofluorobenzene	135		50-150		%	1		09/08/14 19:50

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 19:50
Container ID: 1148458018-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:00
Prep Initial Wt./Vol.: 50.835 g
Prep Extract Vol: 34.4957 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0104	U	0.0209	0.00668	mg/Kg	1		09/08/14 19:50
Ethylbenzene	0.0142	J	0.0417	0.0130	mg/Kg	1		09/08/14 19:50
o-Xylene	1.06		0.0417	0.0130	mg/Kg	1		09/08/14 19:50
P & M -Xylene	0.283		0.0834	0.0250	mg/Kg	1		09/08/14 19:50
Toluene	0.0209	U	0.0417	0.0130	mg/Kg	1		09/08/14 19:50
Surrogates								
1,4-Difluorobenzene	100		72-119		%	1		09/08/14 19:50

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 19:50
Container ID: 1148458018-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:00
Prep Initial Wt./Vol.: 50.835 g
Prep Extract Vol: 34.4957 mL

Results of **11697-101-EX2SW17**

Client Sample ID: **11697-101-EX2SW17**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458019
Lab Project ID: 1148458

Collection Date: 08/28/14 16:05
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 89.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12000		1110	343	mg/Kg	50		09/10/14 01:17
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 01:17

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 01:17
Container ID: 1148458019-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.156 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX2SW17**

Client Sample ID: **11697-101-EX2SW17**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458019
Lab Project ID: 1148458

Collection Date: 08/28/14 16:05
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 89.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	22.0		3.26	0.978	mg/Kg	1		09/08/14 20:09
Surrogates								
4-Bromofluorobenzene	133		50-150		%	1		09/08/14 20:09

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 20:09
Container ID: 1148458019-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:05
Prep Initial Wt./Vol.: 51.716 g
Prep Extract Vol: 30.2803 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00815	U	0.0163	0.00522	mg/Kg	1		09/08/14 20:09
Ethylbenzene	0.0202	J	0.0326	0.0102	mg/Kg	1		09/08/14 20:09
o-Xylene	0.701		0.0326	0.0102	mg/Kg	1		09/08/14 20:09
P & M -Xylene	0.158		0.0652	0.0196	mg/Kg	1		09/08/14 20:09
Toluene	0.0163	U	0.0326	0.0102	mg/Kg	1		09/08/14 20:09
Surrogates								
1,4-Difluorobenzene	100		72-119		%	1		09/08/14 20:09

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 20:09
Container ID: 1148458019-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:05
Prep Initial Wt./Vol.: 51.716 g
Prep Extract Vol: 30.2803 mL

Results of **11697-101-EX1BS02**

Client Sample ID: **11697-101-EX1BS02**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458020
Lab Project ID: 1148458

Collection Date: 08/28/14 16:45
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 85.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	7270		469	145	mg/Kg	20		09/09/14 23:00
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 23:00

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 23:00
Container ID: 1148458020-A

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 09/05/14 17:00
Prep Initial Wt./Vol.: 30.035 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX1BS02**

Client Sample ID: **11697-101-EX1BS02**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458020
Lab Project ID: 1148458

Collection Date: 08/28/14 16:45
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 85.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	99.0		3.79	1.14	mg/Kg	1		09/08/14 20:28
Surrogates								
4-Bromofluorobenzene	414	*	50-150		%	1		09/08/14 20:28

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 20:28
Container ID: 1148458020-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:45
Prep Initial Wt./Vol.: 50.063 g
Prep Extract Vol: 32.3845 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00950	U	0.0190	0.00607	mg/Kg	1		09/08/14 20:28
Ethylbenzene	0.0911		0.0379	0.0118	mg/Kg	1		09/08/14 20:28
o-Xylene	1.77		0.0379	0.0118	mg/Kg	1		09/08/14 20:28
P & M -Xylene	0.503		0.0759	0.0228	mg/Kg	1		09/08/14 20:28
Toluene	0.0129	J	0.0379	0.0118	mg/Kg	1		09/08/14 20:28
Surrogates								
1,4-Difluorobenzene	98.1		72-119		%	1		09/08/14 20:28

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 20:28
Container ID: 1148458020-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:45
Prep Initial Wt./Vol.: 50.063 g
Prep Extract Vol: 32.3845 mL

Print Date: 09/18/2014 9:01:59AM

Results of **11697-101-EX1SW01**

Client Sample ID: **11697-101-EX1SW01**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458021
Lab Project ID: 1148458

Collection Date: 08/28/14 16:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 87.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10400		454	141	mg/Kg	20		09/09/14 20:53
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 20:53

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 20:53
Container ID: 1148458021-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.153 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX1SW01**

Client Sample ID: **11697-101-EX1SW01**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458021
Lab Project ID: 1148458

Collection Date: 08/28/14 16:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 87.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	156		4.03	1.21	mg/Kg	1		09/08/14 20:47
Surrogates								
4-Bromofluorobenzene	419	*	50-150		%	1		09/08/14 20:47

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 20:47
Container ID: 1148458021-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:50
Prep Initial Wt./Vol.: 42.816 g
Prep Extract Vol: 30.2614 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0101	U	0.0201	0.00645	mg/Kg	1		09/08/14 20:47
Ethylbenzene	0.153		0.0403	0.0126	mg/Kg	1		09/08/14 20:47
o-Xylene	3.00		0.0403	0.0126	mg/Kg	1		09/08/14 20:47
P & M -Xylene	0.839		0.0806	0.0242	mg/Kg	1		09/08/14 20:47
Toluene	0.0282	J	0.0403	0.0126	mg/Kg	1		09/08/14 20:47
Surrogates								
1,4-Difluorobenzene	106		72-119		%	1		09/08/14 20:47

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 20:47
Container ID: 1148458021-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 16:50
Prep Initial Wt./Vol.: 42.816 g
Prep Extract Vol: 30.2614 mL

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Results of **11697-101-EX1SW51**

Client Sample ID: **11697-101-EX1SW51**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458022
Lab Project ID: 1148458

Collection Date: 08/28/14 17:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 87.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	9040		457	142	mg/Kg	20		09/09/14 21:02
Surrogates								
5a Androstane	144		50-150		%	20		09/09/14 21:02

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 21:02
Container ID: 1148458022-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.084 g
Prep Extract Vol: 1 mL

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Results of **11697-101-EX1SW51**

Client Sample ID: **11697-101-EX1SW51**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458022
Lab Project ID: 1148458

Collection Date: 08/28/14 17:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 87.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	142		3.99	1.20	mg/Kg	1		09/08/14 21:06
Surrogates								
4-Bromofluorobenzene	395	*	50-150		%	1		09/08/14 21:06

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 21:06
Container ID: 1148458022-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 17:20
Prep Initial Wt./Vol.: 43.882 g
Prep Extract Vol: 30.5573 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00995	U	0.0199	0.00638	mg/Kg	1		09/08/14 21:06
Ethylbenzene	0.136		0.0399	0.0124	mg/Kg	1		09/08/14 21:06
o-Xylene	2.69		0.0399	0.0124	mg/Kg	1		09/08/14 21:06
P & M -Xylene	0.751		0.0797	0.0239	mg/Kg	1		09/08/14 21:06
Toluene	0.0259	J	0.0399	0.0124	mg/Kg	1		09/08/14 21:06
Surrogates								
1,4-Difluorobenzene	102		72-119		%	1		09/08/14 21:06

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 21:06
Container ID: 1148458022-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/28/14 17:20
Prep Initial Wt./Vol.: 43.882 g
Prep Extract Vol: 30.5573 mL

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Results of **11697-101-LSS07**

Client Sample ID: **11697-101-LSS07**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458023
Lab Project ID: 1148458

Collection Date: 08/29/14 12:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	50.7		6.14	1.84	mg/Kg	1000		09/15/14 17:48
2-Methylnaphthalene	8.40		0.614	0.184	mg/Kg	100		09/12/14 12:06
Acenaphthene	2.06		0.614	0.184	mg/Kg	100		09/12/14 12:06
Acenaphthylene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Anthracene	0.501	J	0.614	0.184	mg/Kg	100		09/12/14 12:06
Benzo(a)Anthracene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Benzo[a]pyrene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Benzo[b]Fluoranthene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Benzo[g,h,i]perylene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Benzo[k]fluoranthene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Chrysene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Dibenzo[a,h]anthracene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Fluoranthene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Fluorene	3.05		0.614	0.184	mg/Kg	100		09/12/14 12:06
Indeno[1,2,3-c,d] pyrene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Naphthalene	0.307	U	0.614	0.184	mg/Kg	100		09/12/14 12:06
Phenanthrene	3.52		0.614	0.184	mg/Kg	100		09/12/14 12:06
Pyrene	0.189	J	0.614	0.184	mg/Kg	100		09/12/14 12:06
Surrogates								
2-Fluorobiphenyl	295	*	45-105		%	100		09/12/14 12:06
Terphenyl-d14	102		30-125		%	100		09/12/14 12:06

Batch Information

Analytical Batch: XMS8282
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/12/14 12:06
Container ID: 1148458023-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.517 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8286
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/15/14 17:48
Container ID: 1148458023-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.517 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS07**

Client Sample ID: **11697-101-LSS07**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458023
Lab Project ID: 1148458

Collection Date: 08/29/14 12:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14600		491	152	mg/Kg	20		09/09/14 21:12
Surrogates								
5a Androstane	117		50-150		%	20		09/09/14 21:12

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 21:12
Container ID: 1148458023-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.027 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS07**

Client Sample ID: **11697-101-LSS07**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458023
Lab Project ID: 1148458

Collection Date: 08/29/14 12:00
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	119		3.95	1.19	mg/Kg	1		09/08/14 21:24
Surrogates								
4-Bromofluorobenzene	729	*	50-150		%	1		09/08/14 21:24

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 21:24
Container ID: 1148458023-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:00
Prep Initial Wt./Vol.: 54.781 g
Prep Extract Vol: 35.219 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0170	J	0.0198	0.00632	mg/Kg	1		09/08/14 21:24
Ethylbenzene	1.17		0.0395	0.0123	mg/Kg	1		09/08/14 21:24
o-Xylene	5.36		0.0395	0.0123	mg/Kg	1		09/08/14 21:24
P & M -Xylene	4.89		0.0790	0.0237	mg/Kg	1		09/08/14 21:24
Toluene	0.0494		0.0395	0.0123	mg/Kg	1		09/08/14 21:24
Surrogates								
1,4-Difluorobenzene	103		72-119		%	1		09/08/14 21:24

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 21:24
Container ID: 1148458023-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:00
Prep Initial Wt./Vol.: 54.781 g
Prep Extract Vol: 35.219 mL

Results of **11697-101-LSS57**

Client Sample ID: **11697-101-LSS57**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458024
Lab Project ID: 1148458

Collection Date: 08/29/14 12:30
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.7
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	59.2		6.04	1.81	mg/Kg	1000		09/16/14 12:22
2-Methylnaphthalene	8.91		0.604	0.181	mg/Kg	100		09/12/14 12:22
Acenaphthene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Acenaphthylene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Anthracene	0.483	J	0.604	0.181	mg/Kg	100		09/12/14 12:22
Benzo(a)Anthracene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Benzo[a]pyrene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Benzo[b]Fluoranthene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Benzo[g,h,i]perylene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Benzo[k]fluoranthene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Chrysene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Dibenzo[a,h]anthracene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Fluoranthene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Fluorene	2.92		0.604	0.181	mg/Kg	100		09/12/14 12:22
Indeno[1,2,3-c,d] pyrene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Naphthalene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Phenanthrene	3.46		0.604	0.181	mg/Kg	100		09/12/14 12:22
Pyrene	0.302	U	0.604	0.181	mg/Kg	100		09/12/14 12:22
Surrogates								
2-Fluorobiphenyl	2290	*	45-105		%	100		09/12/14 12:22
Terphenyl-d14	107		30-125		%	100		09/12/14 12:22

Batch Information

Analytical Batch: XMS8282
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/12/14 12:22
Container ID: 1148458024-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.793 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS8289
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 09/16/14 12:22
Container ID: 1148458024-A

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 09/05/14 20:29
Prep Initial Wt./Vol.: 22.793 g
Prep Extract Vol: 1 mL

Results of **11697-101-LSS57**

Client Sample ID: **11697-101-LSS57**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458024
Lab Project ID: 1148458

Collection Date: 08/29/14 12:30
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	22400		1220	379	mg/Kg	50		09/10/14 17:03
Surrogates								
5a Androstane	0	*	50-150		%	50		09/10/14 17:03

Batch Information

Analytical Batch: XFC11556
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/10/14 17:03
Container ID: 1148458024-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.066 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS57**

Client Sample ID: **11697-101-LSS57**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458024
Lab Project ID: 1148458

Collection Date: 08/29/14 12:30
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 81.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	226		40.2	12.1	mg/Kg	10		09/09/14 16:54
Surrogates								
4-Bromofluorobenzene	1230	*	50-150		%	10		09/09/14 16:54

Batch Information

Analytical Batch: VFC12098
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/09/14 16:54
Container ID: 1148458024-B

Prep Batch: VXX26417
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:30
Prep Initial Wt./Vol.: 52.787 g
Prep Extract Vol: 34.6714 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0245		0.0201	0.00643	mg/Kg	1		09/08/14 21:43
Ethylbenzene	1.60		0.0402	0.0125	mg/Kg	1		09/08/14 21:43
o-Xylene	9.44		0.402	0.125	mg/Kg	10		09/09/14 16:54
P & M -Xylene	8.46		0.804	0.241	mg/Kg	10		09/09/14 16:54
Toluene	0.0852		0.0402	0.0125	mg/Kg	1		09/08/14 21:43
Surrogates								
1,4-Difluorobenzene	105		72-119		%	1		09/08/14 21:43

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 21:43
Container ID: 1148458024-B

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:30
Prep Initial Wt./Vol.: 52.787 g
Prep Extract Vol: 34.6714 mL

Analytical Batch: VFC12098
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/09/14 16:54
Container ID: 1148458024-B

Prep Batch: VXX26417
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:30
Prep Initial Wt./Vol.: 52.787 g
Prep Extract Vol: 34.6714 mL

Results of **11697-101-LSS08**

Client Sample ID: **11697-101-LSS08**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458025
Lab Project ID: 1148458

Collection Date: 08/29/14 12:05
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 84.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11800		473	147	mg/Kg	20		09/09/14 21:32
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 21:32

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 21:32
Container ID: 1148458025-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.14 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS08**

Client Sample ID: **11697-101-LSS08**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458025
Lab Project ID: 1148458

Collection Date: 08/29/14 12:05
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 84.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	76.3		3.18	0.953	mg/Kg	1		09/08/14 20:30
Surrogates								
4-Bromofluorobenzene	504	*	50-150		%	1		09/08/14 20:30

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 20:30
Container ID: 1148458025-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:05
Prep Initial Wt./Vol.: 66.574 g
Prep Extract Vol: 35.572 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00795	U	0.0159	0.00508	mg/Kg	1		09/08/14 20:30
Ethylbenzene	0.267		0.0318	0.00991	mg/Kg	1		09/08/14 20:30
o-Xylene	2.10		0.0318	0.00991	mg/Kg	1		09/08/14 20:30
P & M -Xylene	2.29		0.0635	0.0191	mg/Kg	1		09/08/14 20:30
Toluene	0.0156	J	0.0318	0.00991	mg/Kg	1		09/08/14 20:30
Surrogates								
1,4-Difluorobenzene	103		72-119		%	1		09/08/14 20:30

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 20:30
Container ID: 1148458025-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:05
Prep Initial Wt./Vol.: 66.574 g
Prep Extract Vol: 35.572 mL

Results of **11697-101-LSS24**

Client Sample ID: **11697-101-LSS24**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458026
Lab Project ID: 1148458

Collection Date: 08/29/14 12:10
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13300		474	147	mg/Kg	20		09/09/14 21:51
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 21:51

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 21:51
Container ID: 1148458026-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.297 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS24**

Client Sample ID: **11697-101-LSS24**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458026
Lab Project ID: 1148458

Collection Date: 08/29/14 12:10
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	193		37.8	11.4	mg/Kg	10		09/08/14 17:20
Surrogates								
4-Bromofluorobenzene	945	*	50-150		%	10		09/08/14 17:20

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 17:20
Container ID: 1148458026-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:10
Prep Initial Wt./Vol.: 53.526 g
Prep Extract Vol: 33.8249 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0257		0.0189	0.00605	mg/Kg	1		09/08/14 11:57
Ethylbenzene	1.83		0.0378	0.0118	mg/Kg	1		09/08/14 11:57
o-Xylene	6.10		0.0378	0.0118	mg/Kg	1		09/08/14 11:57
P & M -Xylene	6.31		0.0757	0.0227	mg/Kg	1		09/08/14 11:57
Toluene	0.0870		0.0378	0.0118	mg/Kg	1		09/08/14 11:57
Surrogates								
1,4-Difluorobenzene	104		72-119		%	1		09/08/14 11:57

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 11:57
Container ID: 1148458026-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:10
Prep Initial Wt./Vol.: 53.526 g
Prep Extract Vol: 33.8249 mL

Results of **11697-101-LSS33**

Client Sample ID: **11697-101-LSS33**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458027
Lab Project ID: 1148458

Collection Date: 08/29/14 12:15
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 82.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12200		478	148	mg/Kg	20		09/09/14 22:01
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 22:01

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 22:01
Container ID: 1148458027-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.335 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS33**

Client Sample ID: **11697-101-LSS33**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458027
Lab Project ID: 1148458

Collection Date: 08/29/14 12:15
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 82.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	92.2		3.35	1.00	mg/Kg	1		09/08/14 13:13
Surrogates								
4-Bromofluorobenzene	594	*	50-150		%	1		09/08/14 13:13

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 13:13
Container ID: 1148458027-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:15
Prep Initial Wt./Vol.: 65.578 g
Prep Extract Vol: 36.3344 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00835	U	0.0167	0.00536	mg/Kg	1		09/08/14 13:13
Ethylbenzene	0.552		0.0335	0.0104	mg/Kg	1		09/08/14 13:13
o-Xylene	1.96		0.0335	0.0104	mg/Kg	1		09/08/14 13:13
P & M -Xylene	2.55		0.0670	0.0201	mg/Kg	1		09/08/14 13:13
Toluene	0.0221	J	0.0335	0.0104	mg/Kg	1		09/08/14 13:13
Surrogates								
1,4-Difluorobenzene	103		72-119		%	1		09/08/14 13:13

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 13:13
Container ID: 1148458027-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:15
Prep Initial Wt./Vol.: 65.578 g
Prep Extract Vol: 36.3344 mL

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Results of **11697-101-LSS36**

Client Sample ID: **11697-101-LSS36**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458028
Lab Project ID: 1148458

Collection Date: 08/29/14 12:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14200		478	148	mg/Kg	20		09/09/14 22:11
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 22:11

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 22:11
Container ID: 1148458028-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.039 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS36**

Client Sample ID: **11697-101-LSS36**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458028
Lab Project ID: 1148458

Collection Date: 08/29/14 12:20
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	111		3.26	0.977	mg/Kg	1		09/08/14 13:51
Surrogates								
4-Bromofluorobenzene	751	*	50-150		%	1		09/08/14 13:51

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 13:51
Container ID: 1148458028-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:20
Prep Initial Wt./Vol.: 65.604 g
Prep Extract Vol: 35.7319 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0130	J	0.0163	0.00521	mg/Kg	1		09/08/14 13:51
Ethylbenzene	1.18		0.0326	0.0102	mg/Kg	1		09/08/14 13:51
o-Xylene	3.29		0.0326	0.0102	mg/Kg	1		09/08/14 13:51
P & M -Xylene	3.87		0.0651	0.0195	mg/Kg	1		09/08/14 13:51
Toluene	0.0400		0.0326	0.0102	mg/Kg	1		09/08/14 13:51
Surrogates								
1,4-Difluorobenzene	102		72-119		%	1		09/08/14 13:51

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 13:51
Container ID: 1148458028-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:20
Prep Initial Wt./Vol.: 65.604 g
Prep Extract Vol: 35.7319 mL

Results of **11697-101-LSS43**

Client Sample ID: **11697-101-LSS43**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458029
Lab Project ID: 1148458

Collection Date: 08/29/14 12:25
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	15600		478	148	mg/Kg	20		09/09/14 22:21
Surrogates								
5a Androstane	0	*	50-150		%	20		09/09/14 22:21

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 09/09/14 22:21
Container ID: 1148458029-A

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 09/07/14 09:00
Prep Initial Wt./Vol.: 30.135 g
Prep Extract Vol: 1 mL

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Results of **11697-101-LSS43**

Client Sample ID: **11697-101-LSS43**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458029
Lab Project ID: 1148458

Collection Date: 08/29/14 12:25
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%): 83.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	133		3.53	1.06	mg/Kg	1		09/08/14 14:10
Surrogates								
4-Bromofluorobenzene	739	*	50-150		%	1		09/08/14 14:10

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/08/14 14:10
Container ID: 1148458029-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:25
Prep Initial Wt./Vol.: 59.546 g
Prep Extract Vol: 34.9646 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00880	U	0.0176	0.00564	mg/Kg	1		09/08/14 14:10
Ethylbenzene	0.487		0.0353	0.0110	mg/Kg	1		09/08/14 14:10
o-Xylene	7.21		0.0353	0.0110	mg/Kg	1		09/08/14 14:10
P & M -Xylene	4.38		0.0705	0.0212	mg/Kg	1		09/08/14 14:10
Toluene	0.0346	J	0.0353	0.0110	mg/Kg	1		09/08/14 14:10
Surrogates								
1,4-Difluorobenzene	104		72-119		%	1		09/08/14 14:10

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/08/14 14:10
Container ID: 1148458029-B

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 08/29/14 12:25
Prep Initial Wt./Vol.: 59.546 g
Prep Extract Vol: 34.9646 mL

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **31-1-11697 Tanana Power**
Lab Sample ID: 1148458030
Lab Project ID: 1148458

Collection Date: 08/26/14 11:50
Received Date: 09/05/14 10:38
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.40	U	2.79	0.836	mg/Kg	1		09/06/14 01:44
Surrogates								
4-Bromofluorobenzene	89.7		50-150		%	1		09/06/14 01:44

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 09/06/14 01:44
Container ID: 1148458030-A

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 11:50
Prep Initial Wt./Vol.: 44.874 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00695	U	0.0139	0.00446	mg/Kg	1		09/06/14 01:44
Ethylbenzene	0.0140	U	0.0279	0.00869	mg/Kg	1		09/06/14 01:44
o-Xylene	0.0140	U	0.0279	0.00869	mg/Kg	1		09/06/14 01:44
P & M -Xylene	0.0279	U	0.0557	0.0167	mg/Kg	1		09/06/14 01:44
Toluene	0.0140	U	0.0279	0.00869	mg/Kg	1		09/06/14 01:44
Surrogates								
1,4-Difluorobenzene	97.8		72-119		%	1		09/06/14 01:44

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 09/06/14 01:44
Container ID: 1148458030-A

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 08/26/14 11:50
Prep Initial Wt./Vol.: 44.874 g
Prep Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1635291 [SPT/9442]
Blank Lab ID: 1232141

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458014, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020, 1148458021, 1148458022, 1148458023, 1148458024, 1148458025, 1148458026, 1148458027,

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9442
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN
Analytical Date/Time: 9/5/2014 6:40:00PM

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Duplicate Sample Summary

Original Sample ID: 1144306001
Duplicate Sample ID: 1232142

Analysis Date: 09/05/2014 18:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458014, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019. 1148458020. 1148458021. 1148458022. 1148458023. 1148458024. 1148458025. 1148458026. 1148458027.

Results by **SM21 2540G**

NAME	Original ()	Duplicate ()	RPD (%)	RPD CL
Total Solids	93.3	92.6	0.68	15.00

Batch Information

Analytical Batch: SPT9442
Analytical Method: SM21 2540G
Instrument:
Analyst: MJN

Print Date: 09/18/2014 9:02:03AM

Method Blank

Blank ID: MB for HBN 1635310 [VXX/26404]
Blank Lab ID: 1232233

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458030

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	103	50-150		%

Batch Information

Analytical Batch: VFC12094
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/5/2014 3:58:00PM

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 9/5/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26404]
Blank Spike Lab ID: 1232236
Date Analyzed: 09/05/2014 16:55

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26404]
Spike Duplicate Lab ID: 1232237
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458030

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.19	92	10.0	9.54	95	(60-120)	3.70	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25		108	1.25		102	(50-150)	5.90	

Batch Information

Analytical Batch: **VFC12094**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX26404**
Prep Method: **SW5035A**
Prep Date/Time: **09/05/2014 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1635310 [VXX/26404]
Blank Lab ID: 1232233

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458030

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Surrogates				
1,4-Difluorobenzene	97.6	72-119		%

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/5/2014 3:58:00PM

Prep Batch: VXX26404
Prep Method: SW5035A
Prep Date/Time: 9/5/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26404]
Blank Spike Lab ID: 1232234
Date Analyzed: 09/05/2014 16:17

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26404]
Spike Duplicate Lab ID: 1232235
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458030

Results by **SW8021B**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.18	94	1.25	1.21	97	(75-125)	2.70	(< 20)
Ethylbenzene	1.25	1.20	96	1.25	1.24	99	(75-125)	3.30	(< 20)
o-Xylene	1.25	1.18	95	1.25	1.22	98	(75-125)	3.20	(< 20)
P & M -Xylene	2.50	2.38	95	2.50	2.46	98	(80-125)	3.20	(< 20)
Toluene	1.25	1.22	97	1.25	1.25	100	(70-125)	3.00	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25		104	1.25		105	(72-119)	0.79	

Batch Information

Analytical Batch: **VFC12094**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX26404**
Prep Method: **SW5035A**
Prep Date/Time: **09/05/2014 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1148458003
MS Sample ID: 1232238 MS
MSD Sample ID: 1232239 MSD

Analysis Date: 09/05/2014 18:11
Analysis Date: 09/05/2014 18:30
Analysis Date: 09/05/2014 18:49
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458030

Results by **SW8021B**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.00865U	1.40	1.47	104	1.40	1.46	103	75-125	0.92	(< 20)
Ethylbenzene	0.0174U	1.40	1.48	106	1.40	1.46	104	75-125	1.60	(< 20)
o-Xylene	0.0174U	1.40	1.41	101	1.40	1.40	100	75-125	1.20	(< 20)
P & M -Xylene	0.0347U	2.82	2.91	103	2.82	2.87	102	80-125	1.30	(< 20)
Toluene	0.0174U	1.40	1.49	107	1.40	1.48	106	70-125	0.83	(< 20)
Surrogates										
1,4-Difluorobenzene		1.40	1.46	104	1.40	1.46	104	72-119	0.50	

Batch Information

Analytical Batch: VFC12094
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/5/2014 6:30:00PM

Prep Batch: VXX26404
Prep Method: AK101 Extraction (S)
Prep Date/Time: 9/5/2014 8:00:00AM
Prep Initial Wt./Vol.: 50.27g
Prep Extract Vol: 25.00mL

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Method Blank

Blank ID: MB for HBN 1635359 [VXX/26408]
Blank Lab ID: 1232449

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020, 1148458021, 1148458022, 1148458023, 1148458024

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.782J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	99.6	50-150		%

Batch Information

Analytical Batch: VFC12095
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/8/2014 10:21:00AM

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 9/8/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26408]
Blank Spike Lab ID: 1232452
Date Analyzed: 09/08/2014 11:17

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26408]
Spike Duplicate Lab ID: 1232453
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020, 1148458021, 1148458022, 1148458023, 1148458024

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.53	95	10.0	10.0	100	(60-120)	4.90	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25		125	1.25		100	(50-150)	22.20	

Batch Information

Analytical Batch: **VFC12095**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX26408**
Prep Method: **SW5035A**
Prep Date/Time: **09/08/2014 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1635359 [VXX/26408]
Blank Lab ID: 1232449

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020, 1148458021, 1148458022, 1148458023, 1148458024

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Surrogates				
1,4-Difluorobenzene	95.6	72-119		%

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/8/2014 10:21:00AM

Prep Batch: VXX26408
Prep Method: SW5035A
Prep Date/Time: 9/8/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26408]
Blank Spike Lab ID: 1232450
Date Analyzed: 09/08/2014 10:40

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26408]
Spike Duplicate Lab ID: 1232451
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020, 1148458021, 1148458022, 1148458023, 1148458024

Results by **SW8021B**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.12	90	1.25	1.27	101	(75-125)	11.80	(< 20)
Ethylbenzene	1.25	1.15	92	1.25	1.28	102	(75-125)	10.90	(< 20)
o-Xylene	1.25	1.14	91	1.25	1.26	101	(75-125)	10.20	(< 20)
P & M -Xylene	2.50	2.27	91	2.50	2.52	101	(80-125)	10.30	(< 20)
Toluene	1.25	1.16	93	1.25	1.30	104	(70-125)	11.60	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25		97	1.25		103	(72-119)	6.00	

Batch Information

Analytical Batch: **VFC12095**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX26408**
Prep Method: **SW5035A**
Prep Date/Time: **09/08/2014 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1232454
MS Sample ID: 1232455 MS
MSD Sample ID: 1232456 MSD

Analysis Date: 09/08/2014 11:55
Analysis Date: 09/08/2014 12:14
Analysis Date: 09/08/2014 12:33
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020, 1148458021, 1148458022, 1148458023, 1148458024

Results by **SW8021B**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)						
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzene	0.0201	1.29	1.40	107	1.29	1.31	100		75-125	6.20	(< 20)
Ethylbenzene	0.329	1.29	1.69	106	1.29	1.57	97		75-125	7.50	(< 20)
o-Xylene	10.5	1.29	11.7	92	1.29	10.8	24	*	75-125	7.80	(< 20)
P & M -Xylene	4.33	2.57	6.90	100	2.57	6.39	80	*	80-125	7.70	(< 20)
Toluene	0.0831	1.29	1.47	108	1.29	1.37	100		70-125	7.30	(< 20)
Surrogates											
1,4-Difluorobenzene		1.29	1.39	108	1.29	1.30	101		72-119	6.30	

Batch Information

Analytical Batch: VFC12095
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/8/2014 12:14:00PM

Prep Batch: VXX26408
Prep Method: AK101 Extraction (S)
Prep Date/Time: 9/8/2014 8:00:00AM
Prep Initial Wt./Vol.: 48.61g
Prep Extract Vol: 25.00mL

Print Date: 09/18/2014 9:02:08AM

Method Blank

Blank ID: MB for HBN 1635374 [VXX/26413]
Blank Lab ID: 1232514

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458014, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	112	50-150		%

Batch Information

Analytical Batch: VFC12096
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 9/8/2014 10:23:00AM

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 9/8/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26413]
Blank Spike Lab ID: 1232517
Date Analyzed: 09/08/2014 11:20

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26413]
Spike Duplicate Lab ID: 1232518
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458014, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	10.6	106	10.0	10.7	107	(60-120)	1.20	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25		113	1.25		114	(50-150)	1.40	

Batch Information

Analytical Batch: **VFC12096**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX26413**
Prep Method: **SW5035A**
Prep Date/Time: **09/08/2014 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1635374 [VXX/26413]
Blank Lab ID: 1232514

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458014, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Surrogates				
1,4-Difluorobenzene	101	72-119		%

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 9/8/2014 10:23:00AM

Prep Batch: VXX26413
Prep Method: SW5035A
Prep Date/Time: 9/8/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26413]
Blank Spike Lab ID: 1232515
Date Analyzed: 09/08/2014 10:42

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26413]
Spike Duplicate Lab ID: 1232516
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458014, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **SW8021B**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.43	114	1.25	1.36	109	(75-125)	4.70	(< 20)
Ethylbenzene	1.25	1.30	104	1.25	1.23	98	(75-125)	5.20	(< 20)
o-Xylene	1.25	1.27	102	1.25	1.21	97	(75-125)	4.90	(< 20)
P & M -Xylene	2.50	2.56	102	2.50	2.43	97	(80-125)	5.10	(< 20)
Toluene	1.25	1.33	106	1.25	1.26	101	(70-125)	5.20	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25		106	1.25		105	(72-119)	1.70	

Batch Information

Analytical Batch: **VFC12096**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX26413**
Prep Method: **SW5035A**
Prep Date/Time: **09/08/2014 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1232519
MS Sample ID: 1232520 MS
MSD Sample ID: 1232521 MSD

Analysis Date: 09/08/2014 11:57
Analysis Date: 09/08/2014 12:16
Analysis Date: 09/08/2014 12:35
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1148458014, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **SW8021B**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.0159	1.17	1.42	121	1.17	1.41	119	75-125	0.97	(< 20)
Ethylbenzene	1.13	1.17	2.40	109	1.17	2.39	108	75-125	0.37	(< 20)
o-Xylene	3.77	1.17	6.23	211 *	1.17	6.26	213 *	75-125	0.39	(< 20)
P & M -Xylene	3.90	2.34	6.35	105	2.34	6.30	103	80-125	0.67	(< 20)
Toluene	0.0537	1.17	1.36	112	1.17	1.34	110	70-125	0.93	(< 20)
Surrogates										
1,4-Difluorobenzene		1.17	1.28	110	1.17	1.27	109	72-119	0.73	

Batch Information

Analytical Batch: VFC12096
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 9/8/2014 12:16:00PM

Prep Batch: VXX26413
Prep Method: AK101 Extraction (S)
Prep Date/Time: 9/8/2014 8:00:00AM
Prep Initial Wt./Vol.: 53.53g
Prep Extract Vol: 25.00mL

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Method Blank

Blank ID: MB for HBN 1635495 [VXX/26417]
Blank Lab ID: 1232689

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458017, 1148458024

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	101	50-150		%

Batch Information

Analytical Batch: VFC12098
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/9/2014 11:33:00AM

Prep Batch: VXX26417
Prep Method: SW5035A
Prep Date/Time: 9/9/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26417]
Blank Spike Lab ID: 1232692
Date Analyzed: 09/09/2014 12:29

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26417]
Spike Duplicate Lab ID: 1232693
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458017, 1148458024

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.87	99	10.0	9.84	98	(60-120)	0.30	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25		99	1.25		101	(50-150)	2.00	

Batch Information

Analytical Batch: **VFC12098**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX26417**
Prep Method: **SW5035A**
Prep Date/Time: **09/09/2014 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1635495 [VXX/26417]
Blank Lab ID: 1232689

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458017, 1148458024

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Surrogates				
1,4-Difluorobenzene	97.6	72-119		%

Batch Information

Analytical Batch: VFC12098
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/9/2014 11:33:00AM

Prep Batch: VXX26417
Prep Method: SW5035A
Prep Date/Time: 9/9/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [VXX26417]
Blank Spike Lab ID: 1232690
Date Analyzed: 09/09/2014 11:52

Spike Duplicate ID: LCSD for HBN 1148458 [VXX26417]
Spike Duplicate Lab ID: 1232691
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458017, 1148458024

Results by **SW8021B**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
o-Xylene	1.25	1.23	99	1.25	1.24	99	(75-125)	0.45	(< 20)
P & M -Xylene	2.50	2.49	99	2.50	2.49	100	(80-125)	0.31	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25		102	1.25		106	(72-119)	3.20	

Batch Information

Analytical Batch: **VFC12098**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX26417**
Prep Method: **SW5035A**
Prep Date/Time: **09/09/2014 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dup Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1144371005
MS Sample ID: 1232694 MS
MSD Sample ID: 1232695 MSD

Analysis Date: 09/09/2014 13:07
Analysis Date: 09/09/2014 13:26
Analysis Date: 09/09/2014 13:45
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458017, 1148458024

Results by **SW8021B**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
o-Xylene	0.0212U	0.788	0.787	100	0.788	0.761	97	75-125	3.40	(< 20)
P & M -Xylene	0.0424U	1.57	1.61	102	1.57	1.55	99	80-125	3.50	(< 20)
Surrogates										
1,4-Difluorobenzene		0.788	0.824	105	0.788	0.805	102	72-119	2.30	

Batch Information

Analytical Batch: VFC12098
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 9/9/2014 1:26:00PM

Prep Batch: VXX26417
Prep Method: AK101 Extraction (S)
Prep Date/Time: 9/9/2014 8:00:00AM
Prep Initial Wt./Vol.: 87.97g
Prep Extract Vol: 25.00mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1635261 [XXX/31915]
Blank Lab ID: 1232022

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458014, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	93.1	60-120		%

Batch Information

Analytical Batch: XFC11553
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: AYC
Analytical Date/Time: 9/8/2014 8:56:00PM

Prep Batch: XXX31915
Prep Method: SW3550C
Prep Date/Time: 9/5/2014 5:00:44PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [XXX31915]
Blank Spike Lab ID: 1232023
Date Analyzed: 09/08/2014 21:06

Spike Duplicate ID: LCSD for HBN 1148458 [XXX31915]
Spike Duplicate Lab ID: 1232024
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458001, 1148458002, 1148458003, 1148458004, 1148458005, 1148458006, 1148458007, 1148458008, 1148458009, 1148458010, 1148458011, 1148458012, 1148458013, 1148458014, 1148458015, 1148458016, 1148458017, 1148458018, 1148458019, 1148458020

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	150	90	167	159	96	(75-125)	5.80	(< 20)
Surrogates									
5a Androstane	3.33		103	3.33		109	(60-120)	5.50	

Batch Information

Analytical Batch: **XFC11553**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **AYC**

Prep Batch: **XXX31915**
Prep Method: **SW3550C**
Prep Date/Time: **09/05/2014 17:00**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dup Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1635267 [XXX/31917]
Blank Lab ID: 1232038

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458010, 1148458011, 1148458012, 1148458023, 1148458024

Results by **8270D SIMS (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.00250U	0.00500	0.00150	mg/Kg
2-Methylnaphthalene	0.00250U	0.00500	0.00150	mg/Kg
Acenaphthene	0.00250U	0.00500	0.00150	mg/Kg
Acenaphthylene	0.00250U	0.00500	0.00150	mg/Kg
Anthracene	0.00250U	0.00500	0.00150	mg/Kg
Benzo(a)Anthracene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[a]pyrene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[b]Fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[g,h,i]perylene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[k]fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Chrysene	0.00250U	0.00500	0.00150	mg/Kg
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	mg/Kg
Fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Fluorene	0.00250U	0.00500	0.00150	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.00250U	0.00500	0.00150	mg/Kg
Naphthalene	0.00250U	0.00500	0.00150	mg/Kg
Phenanthrene	0.00250U	0.00500	0.00150	mg/Kg
Pyrene	0.00250U	0.00500	0.00150	mg/Kg
Surrogates				
2-Fluorobiphenyl	45.8	45-105		%
Terphenyl-d14	95	30-125		%

Batch Information

Analytical Batch: XMS8280
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 9/11/2014 7:25:00PM

Prep Batch: XXX31917
Prep Method: SW3550C
Prep Date/Time: 9/5/2014 8:29:44PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

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200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [XXX31917]
Blank Spike Lab ID: 1232039
Date Analyzed: 09/11/2014 19:41

Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458010, 1148458011, 1148458012, 1148458023, 1148458024

Results by **8270D SIMS (PAH)**

Blank Spike (mg/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	0.0222	0.0140	63	(44-107)
2-Methylnaphthalene	0.0222	0.0126	57	(45-105)
Acenaphthene	0.0222	0.0145	66	(45-110)
Acenaphthylene	0.0222	0.0148	66	(45-105)
Anthracene	0.0222	0.0173	78	(55-105)
Benzo(a)Anthracene	0.0222	0.0217	98	(50-110)
Benzo[a]pyrene	0.0222	0.0182	82	(50-110)
Benzo[b]Fluoranthene	0.0222	0.0217	98	(45-115)
Benzo[g,h,i]perylene	0.0222	0.0203	91	(40-125)
Benzo[k]fluoranthene	0.0222	0.0207	93	(45-125)
Chrysene	0.0222	0.0225	101	(55-110)
Dibenzo[a,h]anthracene	0.0222	0.0204	92	(40-125)
Fluoranthene	0.0222	0.0213	96	(55-115)
Fluorene	0.0222	0.0156	70	(50-110)
Indeno[1,2,3-c,d] pyrene	0.0222	0.0202	91	(40-120)
Naphthalene	0.0222	0.0130	58	(40-105)
Phenanthrene	0.0222	0.0180	81	(50-110)
Pyrene	0.0222	0.0208	94	(45-125)
Surrogates				
2-Fluorobiphenyl	0.0222		64	(45-105)
Terphenyl-d14	0.0222		99	(30-125)

Batch Information

Analytical Batch: **XMS8280**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **RTS**

Prep Batch: **XXX31917**
Prep Method: **SW3550C**
Prep Date/Time: **09/05/2014 20:29**
Spike Init Wt./Vol.: 0.0222 mg/Kg Extract Vol: 1 mL
Dup Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1144270001
MS Sample ID: 1232040 MS
MSD Sample ID: 1232041 MSD

Analysis Date: 09/11/2014 21:22
Analysis Date: 09/11/2014 21:39
Analysis Date: 09/11/2014 21:55
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458010, 1148458011, 1148458012, 1148458023, 1148458024

Results by **8270D SIMS (PAH)**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.0286U	0.0255	0.0350	137	*	0.0250	0.0367	146	*	44-107	4.70	(< 30)
2-Methylnaphthalene	0.0287	0.0255	0.0497	82		0.0250	0.0487	80		45-105	1.90	(< 30)
Acenaphthene	0.0286U	0.0255	0.0432	170	*	0.0250	0.0524	209	*	45-110	19.20	(< 30)
Acenaphthylene	0.0286U	0.0255	0.0267J	105		0.0250	0.0297	119	*	45-105	10.60	(< 30)
Anthracene	0.0287	0.0255	0.0515	89		0.0250	0.0560	109	*	55-105	8.40	(< 30)
Benzo(a)Anthracene	0.0310	0.0255	0.0620	122	*	0.0250	0.0636	130	*	50-110	2.60	(< 30)
Benzo[a]pyrene	0.0286U	0.0255	0.0143U	0	*	0.0250	0.0570	228	*	50-110	0.00	(< 30)
Benzo[b]Fluoranthene	0.0286U	0.0255	0.0143U	0	*	0.0250	0.00J	0	*	45-115	0.00	(< 30)
Benzo[g,h,i]perylene	0.0286U	0.0255	0.0443	174	*	0.0250	0.0485	194	*	40-125	9.00	(< 30)
Benzo[k]fluoranthene	0.0286U	0.0255	0.0143U	0	*	0.0250	0.00J	0	*	45-125	0.00	(< 30)
Chrysene	0.0613	0.0255	0.0978	143	*	0.0250	0.100	156	*	55-110	2.60	(< 30)
Dibenzo[a,h]anthracene	0.0286U	0.0255	0.0251J	99		0.0250	0.0261J	104		40-125	4.00	(< 30)
Fluoranthene	0.0573	0.0255	0.0932	141	*	0.0250	0.0972	159	*	55-115	4.20	(< 30)
Fluorene	0.0286U	0.0255	0.0554	217	*	0.0250	0.0557	222	*	50-110	0.57	(< 30)
Indeno[1,2,3-c,d] pyrene	0.0286U	0.0255	0.0389	153	*	0.0250	0.0446	178	*	40-120	13.50	(< 30)
Naphthalene	0.0286U	0.0255	0.0312	122	*	0.0250	0.0308	123	*	40-105	0.92	(< 30)
Phenanthrene	0.0462	0.0255	0.0772	122	*	0.0250	0.0812	140	*	50-110	5.10	(< 30)
Pyrene	0.177	0.0255	0.232	214	*	0.0250	0.231	210	*	45-125	0.85	(< 30)
Surrogates												
2-Fluorobiphenyl		0.0255	0.0206	81		0.0250	0.0212	85		45-105	2.80	
Terphenyl-d14		0.0255	0.0286	112		0.0250	0.0278	111		30-125	3.00	

Batch Information

Analytical Batch: XMS8280
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 9/11/2014 9:39:00PM

Prep Batch: XXX31917
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 9/5/2014 8:29:44PM
Prep Initial Wt./Vol.: 22.52g
Prep Extract Vol: 1.00mL

Print Date: 09/18/2014 9:02:16AM

Method Blank

Blank ID: MB for HBN 1635279 [XXX/31923]
Blank Lab ID: 1232093

Matrix: Soil/Solid (dry weight)

QC for Samples:
1148458021, 1148458022, 1148458023, 1148458024, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	89.1	60-120		%

Batch Information

Analytical Batch: XFC11557
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: AYC
Analytical Date/Time: 9/9/2014 2:01:00PM

Prep Batch: XXX31923
Prep Method: SW3550C
Prep Date/Time: 9/7/2014 9:00:44AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1148458 [XXX31923]
Blank Spike Lab ID: 1232094
Date Analyzed: 09/09/2014 14:11

Spike Duplicate ID: LCSD for HBN 1148458 [XXX31923]
Spike Duplicate Lab ID: 1232095
Matrix: Soil/Solid (dry weight)

QC for Samples: 1148458021, 1148458022, 1148458023, 1148458024, 1148458025, 1148458026, 1148458027, 1148458028, 1148458029

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	150	90	167	160	96	(75-125)	6.20	(< 20)
Surrogates									
5a Androstane	3.33		104	3.33		113	(60-120)	8.10	

Batch Information

Analytical Batch: **XFC11557**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **AYC**

Prep Batch: **XXX31923**
Prep Method: **SW3550C**
Prep Date/Time: **09/07/2014 09:00**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dup Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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1148458

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Page 1 of 3

Laboratory SGS
Attn: Jen Dawkins

400 N. 34th Street, Suite 100
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Portland, OR 97201-2498
(503) 223-6147

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRO AK102	GRO AK101	BTEX EPA 8021B	PAH EPA 8270D			Total Number of Containers	Remarks/Matrix
11697-101-LFS01	1A-B	1150	8/26		X	X	X	X				2	
11697-101-LFS10	2A-B	1155	8/26			X	X	X				2	
11697-101-LFS50	3A-B	1220	8/26			X	X	X				2	
11697-101-LFS13	4A-B	1200	8/26			X	X	X				2	
11697-101-LFS27	5A-B	1205	8/26			X	X	X				2	
11697-101-LFS31	6A-B	1040	8/28			X	X	X				2	
11697-101-LFS35	7A-B	1045	8/28			X	X	X				2	
11697-101-EX2BS01	8A-B	1510	8/28			X	X	X				2	
11697-101-EX2BSS1	9A-B	1540	8/28			X	X	X				2	
30A * Trip Blank	101-68-10	—	8-22-14									1	

Project Information		Sample Receipt	
Project Number:	31-1-11697	Total Number of Containers	
Project Name:	Tanana Power	COC Seals/Intact? Y/N/NA	—
Contact:	JAK	Received Good Cond./Cold	—
Ongoing Project?	~~Yes~~ (No) ~~No~~ (Yes)	Delivery Method:	Hand
Sampler:	JCT	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 2:10	Signature: Time: 1600	Signature: Time:
Printed Name: VALERIE WEBB Date: 9/4	Printed Name: Date: 9-4-14	Printed Name: Date:
Company: SHANNON + WILSON	Company: SGS	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1600	Signature: Time:	Signature: Time: 10:28
Printed Name: Jen Dawkins Date: 9-4-14	Printed Name: Date:	Printed Name: Cory Dunning Date: 9/5/14
Company: SGS	Company:	Company: SGS

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

F-19-91/UR

* Trip Blank in same cooler as BTEX/GRO samples.

No. 32693

1148458

SHANNON & WILSON, INC. — CHAIN OF CUSTODY RECORD

Geotechnical and Environmental Consultants

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Laboratory SGS
Attn: JENNIFER DAWKINS

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRO AK102	GRO AK101	BTEX EPA 8021B	PAH EPA 8270D			Total Number of Containers	Remarks/Matrix
11697-101-EX2BS06	10 A-B	1515	8/28		X	X	X	X	X			2	
11697-101-EX2BS56	11 A-B	1555	8/28		X	X	X	X	X			2	
11697-101-EX2BS07	12 A-B	1520	8/28		X	X	X	X	X			2	
11697-101-EX2BS13	13 A-B	1525	8/28		X	X	X	X				2	
11697-101-EX2BS16	14 A-B	1530	8/28		X	X	X	X				2	
11697-101-EX2SW04	15 A-B	1535	8/28		X	X	X	X				2	
11697-101-EX2SW05	16 A-B	1545	8/28		X	X	X	X				2	
11697-101-EX2SW08	17 A-B	1550	8/28		X	X	X	X				2	
11697-101-EX2SW09	18 A-B	1600	8/28		X	X	X	X				2	
11697-101-EX2SW17	19 A-B	1605	8/28		X	X	X	X				2	

Project Information		Sample Receipt	
Project Number: 31-1-11697		Total Number of Containers	
Project Name: TANANA POWER		COC Seals/Intact? Y/N/NA	
Contact: JAK		Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐		Delivery Method:	
Sampler: J CT		(attach shipping bill, if any)	

Instructions
Requested Turnaround Time: STANDARD
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 2:10	Signature: Time: 1600	Signature: Time:
Printed Name: VALERIE WEBB Date: 9/4	Printed Name: Date: 9.4.14	Printed Name: Date:
Company: SHANNON + WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1410	Signature: Time:	Signature: Time: 10:28
Printed Name: Date: 9-4-14	Printed Name: Date:	Printed Name: Date: 9/5/14
Company:	Company:	Company: SGS

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

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No. 32704

1148458

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

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Laboratory SGS Page 3 of 3
Attn: JENNIFER DAWKINS

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRO AK 102	GRO AK 101	BTEX EPA 8021B	PAH EPA 8270D			Total Number of Containers	Remarks/Matrix
11697-101-EXIBS02	20 A-B	1645	8/28		X	X	X	X					
11697-101-EXISW01	21 A-B	1650	8/28		|	X	X	X					
11697-101-EXISW51	22 A-B	1720	8/28		|	X	X	X					
11697-101-LSS07	23 A-B	1200	8/29		|	X	X	X	X				
11697-101-LSS57	24 A-B	1230	8/29		|	X	X	X	X				
11697-101-LSS08	25 A-B	1205	8/29		|	X	X	X					
11697-101-LSS24	26 A-B	1210	8/29		|	X	X	X					
11697-101-LSS33	27 A-B	1215	8/29		|	X	X	X					
11697-101-LSS36	28 A-B	1220	8/29		|	X	X	X					
11697-101-LSS43	29 A-B	1225	8/29		|	X	X	X					

Project Information		Sample Receipt	
Project Number:	31-1-11697	Total Number of Containers	
Project Name:	TANANA POWER	COC Seals/Intact? Y/N/NA	
Contact:	JAK	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	JCT	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	STANDARD
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature:	Signature:	Signature:
Time: 2:10	Time: 1600	Time:
Printed Name: VALERIE WEBB	Printed Name: BEN	Printed Name:
Date: 9/4	Date: 9-4-14	Date:
Company: SHANNON + WILSON	Company: SGS	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature:	Signature:	Signature:
Time: 1410	Time:	Time: 10:20
Printed Name: BEN HAWKINS	Printed Name:	Printed Name: CORY DURNING
Date: 9-4-14	Date:	Date: 9/5/14
Company: SGS	Company:	Company: SGS

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

F-19-91/UR

No. 32703

SGS

1148458

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No N/A Yes No	☐ *Exemption permitted if sampler hand carries/delivers.*
Temperature blank compliant* (i.e., 0-6°C after CF)? *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled."	Yes No Yes No N/A Yes No N/A	☐ *Exemption permitted if chilled & collected <8 hrs ago.* Samples chilled, proceed w/ analysis per client. -JAED ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery method (specify all that apply): Client (hand-carried) USPS Lynden AK Air Alert Courier UPS FedEx RAVN C&D Delivery Carlile Pen Air Warp Speed Other: _____ → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	Tracking/AB # or see attached or N/A Yes No N/A	
→ For samples received with payment, note amount ($) and whether cash / check / CC **(circle one)** was received. → For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed. SRF initiated in FBKS by: JD		
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	Yes No N/A Yes No N/A Yes No N/A	***Note: Refer to form F-083 "Sample Guide" for hold times.*** ***Note: If times differ <1hr, record details and login per COC.***
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	Yes No	
Were **proper containers** (type/mass/volume/preservative*) used? Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	Yes No N/A Yes No N/A Yes No N/A Yes No N/A	☐ *Exemption permitted for metals (e.g., 200.8/6020A).*
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No N/A Yes No N/A	
For **special handling** (e.g., "MI" soils, foreign soils, lab filter for dissolved…, lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	Yes No N/A	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No N/A	Earliest break: 9-9-14
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	Yes No N/A	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No N/A	SRF Completed by: CRD PM notified: N/A
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	Yes No N/A	Peer Reviewed by: N/A
Additional notes (if applicable):		

Note to Client: *Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.*

SGS

SGS WO#

1148458

SAMPLE RECEIPT FORM FOR TRANSFERS

Note: This form is to be completed by Anchorage Sample Receiving staff for all shipments received at SGS-Anchorage from SGS-Fairbanks.

Were samples received numbered with all criteria on Sample Receipt Form F0004 documented by Fairbanks Sample Receiving staff? If "No," ***Anchorage Sample Receiving staff must complete the receiving process & document pH verification, sample condition, etc. on the SRF initiated by Fairbanks staff*** (attached).	Yes (No) N/A	Use space below for additional notes…
If work was pre-logged, was the predefined comment cleared?	Yes No (N/A)	

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location: 1F, 1B	(Yes) No N/A	
COC accompanied samples?	(Yes) No N/A	
Temperature blank compliant (i.e., 0-6°C after correction factor)?	(Yes) No N/A	
Cooler ID: 1 @ 2.6 w/ Therm.ID: 71		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Note: If non-compliant, use form FS-0029 to document affected samples/analyses. If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP** will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." **If temperature(s) <0°C, were all containers ice free?**	Yes No (N/A)	
RUSH/SHORT Hold e-mail **forwarded** to lab if applicable?	(Yes) No N/A	
Delivery method: (Lynden) Other:		
Completed by: Cory D 9/5/14 10:28		

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1148458001-A	No Preservative Required	OK
1148458001-B	Methanol field pres. 4 C	OK
1148458002-A	No Preservative Required	OK
1148458002-B	Methanol field pres. 4 C	OK
1148458003-A	No Preservative Required	OK
1148458003-B	Methanol field pres. 4 C	OK
1148458004-A	No Preservative Required	OK
1148458004-B	Methanol field pres. 4 C	OK
1148458005-A	No Preservative Required	OK
1148458005-B	Methanol field pres. 4 C	OK
1148458006-A	No Preservative Required	OK
1148458006-B	Methanol field pres. 4 C	OK
1148458007-A	No Preservative Required	OK
1148458007-B	Methanol field pres. 4 C	OK
1148458008-A	No Preservative Required	OK
1148458008-B	Methanol field pres. 4 C	OK
1148458009-A	No Preservative Required	OK
1148458009-B	Methanol field pres. 4 C	OK
1148458010-A	No Preservative Required	OK
1148458010-B	Methanol field pres. 4 C	OK
1148458011-A	No Preservative Required	OK
1148458011-B	Methanol field pres. 4 C	OK
1148458012-A	No Preservative Required	OK
1148458012-B	Methanol field pres. 4 C	OK
1148458013-A	No Preservative Required	OK
1148458013-B	Methanol field pres. 4 C	OK
1148458014-A	No Preservative Required	OK
1148458014-B	Methanol field pres. 4 C	OK
1148458015-A	No Preservative Required	OK
1148458015-B	Methanol field pres. 4 C	OK
1148458016-A	No Preservative Required	OK
1148458016-B	Methanol field pres. 4 C	OK
1148458017-A	No Preservative Required	OK
1148458017-B	Methanol field pres. 4 C	OK
1148458018-A	No Preservative Required	OK
1148458018-B	Methanol field pres. 4 C	OK
1148458019-A	No Preservative Required	OK
1148458019-B	Methanol field pres. 4 C	OK
1148458020-A	No Preservative Required	OK
1148458020-B	Methanol field pres. 4 C	OK
1148458021-A	No Preservative Required	OK
1148458021-B	Methanol field pres. 4 C	OK
1148458022-A	No Preservative Required	OK
1148458022-B	Methanol field pres. 4 C	OK
1148458023-A	No Preservative Required	OK
1148458023-B	Methanol field pres. 4 C	OK
1148458024-A	No Preservative Required	OK
1148458024-B	Methanol field pres. 4 C	OK
1148458025-A	No Preservative Required	OK
1148458025-B	Methanol field pres. 4 C	OK
1148458026-A	No Preservative Required	OK
1148458026-B	Methanol field pres. 4 C	OK
1148458027-A	No Preservative Required	OK
1148458027-B	Methanol field pres. 4 C	OK
1148458028-A	No Preservative Required	OK
1148458028-B	Methanol field pres. 4 C	OK
1148458029-A	No Preservative Required	OK
1148458029-B	Methanol field pres. 4 C	OK
1148458030-A	Methanol field pres. 4 C	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

Laboratory Data Review Checklist

Completed by: Julie Keener

Title: Senior Engineer Date: October 29, 2014

CS Report Name: 2014 ADEC Tanana Power Report Date: September 18, 2014

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1148458

ADEC File Number: 780.38.014 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐Yes ☐ No ☒NA (Please explain.) Comments:

      All analyses were performed by SGS North America, Inc. in Anchorage, Alaska.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      Sample collector (Jake Tracy) did not prepare a COC or sign samples over to Valerie Webb, who prepared the COC and delivered the samples to the laboratory. The samples were in Mr. Tracy's possession or securely stored in Shannon & Wilson's office prior to their delivery to the laboratory for analysis.

   b. Correct analyses requested?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      Temperature blanks were measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the SGS Anchorage laboratory. As specified in the EPA publication SW-846, temperatures within this range are considered acceptable; this range has been approved by ADEC.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☐Yes ☐ No ☒NA (Please explain.) Comments:

The laboratory did not note any discrepancies with the samples reported in this work order.

e. Data quality or usability affected? (Please explain.)
Comments:

Samples were in possession of Shannon & Wilson until receipt by SGS. The data are not affected.

4. Case Narrative
a. Present and understandable?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The GRO surrogate recoveries did not meet QC criteria (biased high) due to matrix interferences for samples -EX2BS01, -EX2BS51, -EX2BS06, -EX2BS56, -EX2BS07, -EX2BS13, -EX2BS16, -EX2SW04, -EX2SW05, -EX2SW08, -EX1BS02, -EX1SW01, -EX1SW51, -LSS07, -LSS57, -LSS08, -LSS24, -LSS33, -LSS36, and -LSS43. The GRO results for these samples are considered biased high.

The DRO surrogate recovery was outside QC criteria due to sample dilution for samples -EX2BS01, -EX2BS51, -EX2BS06, -EX2BS56, -EX2BS07, -EX2BS13, -EX2BS16, -EX2SW04, -EX2SW05, -EX2SW08, -EX2SW09, -EX2SW17, -EX1BS02, -EX1SW01, -LSS57, -LSS08, -LSS24, -LSS33, -LSS36, and -LSS43. The associated sample results are unaffected by surrogate failures due to dilution.

The PAH surrogate recoveries were above QC criteria due to sample dilution for samples -EX2BS06, -EX2BS56, -EX2BS07, and -LSS57. The associated sample results are unaffected by surrogate failures due to dilution.

PAH limits of quantitation (LOQs) were elevated for samples -EX2BS06, -EX2BS56, -EX2BS07, -LSS07, and -LSS57 due to sample dilution. Samples were analyzed at dilution due to matrix interference with internal standards.

c. Were all corrective actions documented?
☐Yes ☐ No ☒NA (Please explain.) Comments:

Corrective action was not required.

d. What is the effect on data quality/usability according to the case narrative?
Comments:

The affected GRO sample results for the samples noted above are considered to be biased high.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
☒Yes ☐ No ☐NA (Please explain.) Comments:

b. All applicable holding times met?
☒Yes ☐ No ☐NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

☒Yes ☐ No ☐NA (Please explain.) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
☒Yes ☒ No ☐NA (Please explain.) Comments:

All LODs (reporting values) were less than the ADEC soil-cleanup levels.

e. Data quality or usability affected?
Comments:

Data quality is not affected.

6. QC Samples
a. Method Blank
i. One method blank reported per matrix, analysis and 20 samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. All method blank results less than PQL?
☒Yes ☐ No ☐NA (Please explain.) Comments:

There were no analytes detected in the method blanks.

iii. If above PQL, what samples are affected?
Comments:

No samples were affected.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No samples were affected.

v. Data quality or usability affected? (Please explain.)
Comments:

Data quality and usability were not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
☒Yes ☐ No ☐NA (Please explain.) Comments:

MS/MSD are also assessed in this section.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Only analysis for organic compounds was requested.

☐Yes ☐ No ☒NA (Please explain.) Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
☐Yes ☒ No ☐NA (Please explain.) Comments:

There were MSD recovery failures for o-xylene for samples due to matrix interference. The samples spiked were not samples from this project, so our results are unaffected by the recovery failures. The LCS/LCSD recoveries were within limits and are used to assess accuracy.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
☐Yes ☒ No ☐NA (Please explain.) Comments:

The PAH MS/MSD RPD for benzo(a)pyrene (laboratory sample 1144270001 MSD) does not meet QC criteria. The sample spiked for this analysis was not part of our project sample set, so the RPD failure does not affect the data quality.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments:

The project samples were unaffected; see above.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

The project samples were unaffected; see above.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

The samples spiked were not from this project, so our results are unaffected by the recovery or RPD failures.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐Yes ☒ No ☐NA (Please explain.) Comments:

The GRO surrogate recoveries did not meet QC criteria (biased high) due to matrix interferences for samples -EX2BS01, -EX2BS51, -EX2BS06, -EX2BS56, -EX2BS07, -EX2BS13, -EX2BS16, -EX2SW04, -EX2SW05, -EX2SW08, -EX1BS02, -EX1SW01, -EX1SW51, -LSS07, -LSS57, -LSS08, -LSS24, -LSS33, -LSS36, and -LSS43. The GRO results for these samples are considered biased high.

The DRO surrogate recovery was outside QC criteria due to sample dilution for samples -EX2BS01, -EX2BS51, -EX2BS06, -EX2BS56, -EX2BS07, -EX2BS13, -EX2BS16, -EX2SW04, -EX2SW05, -EX2SW08, -EX2SW09, -EX2SW17, -EX1BS02, -EX1SW01, -LSS57, -LSS08, -LSS24, -LSS33, -LSS36, and -LSS43. The associated sample results are unaffected by surrogate failures due to dilution.

The PAH surrogate recoveries were above QC criteria due to sample dilution for samples -EX2BS06, -EX2BS56, -EX2BS07, and -LSS57. The associated sample results are unaffected by surrogate failures due to dilution.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☒Yes ☐ No ☐NA (Please explain.) Comments:

The affected GRO sample results will be flagged 'JH' to indicate a high bias.

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Yes; see 6.c.iii.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☐Yes ☒ No ☐NA (Please explain.) Comments:

One cooler was used to transport all samples to the SGS sample-receiving office. Samples were then shipped to the SGS analytical laboratory in Anchorage. The trip blank accompanied the VOA samples throughout sampling and shipping.

iii. All results less than PQL?
☒Yes ☐ No ☐NA (Please explain.) Comments:

No analytes were detected in the trip blank.

iv. If above PQL, what samples are affected?
Comments:

No analytes were detected in the trip blank. The samples were not affected.

v. Data quality or usability affected? (Please explain.)
Comments:

No. Data quality and usability are unaffected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Submitted blind to lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Field-duplicate samples LFS01/-LSS50, -EX2BS01/-EX2BS51, -EX2BS06/-EX2BS56, -EX1SW01/-EX1SW51, and -LSS07/-LSS57 were submitted in this work order.

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐Yes ☒ No ☐NA (Please explain.) Comments:

The field duplicate pair -LSS07/-LSS57 had RPDs of 62% for GRO, 53% for toluene, 55% for o-xylene, and 53% for p&m-xylenes.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)
Comments:

The results for these analytes will be flagged 'J*' as estimates due to imprecision.

f. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☐ No ☒NA (Please explain.) Comments:

No equipment blanks were submitted in this work order, in accordance with the project SAP.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No equipment blanks were submitted in this work order.

ii. If above PQL, what samples are affected?

Comments:

No samples were affected.

iii. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability were not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐Yes ☐ No ☒NA (Please explain.) Comments:

There were no other data flags/qualifiers.

APPENDIX E

QUALITY ASSURANCE/QUALITY CONTROL REVIEW

QUALITY ASSURANCE/QUALITY CONTROL REVIEW

Quality Assurance/Quality Control (QA/QC) procedures assist in producing data of acceptable quality and reliability. We reviewed the analytical results for laboratory QC samples, and also conducted our own QA assessment for this project. We reviewed the chain-of-custody (COC) records and laboratory-receipt forms to check that custody was not breached, sample holding-times were met, and the samples were kept properly chilled (between 0 ºC [degrees centigrade] and 6 ºC) during shipping. Our QA review procedures allowed us to document the accuracy and precision of the analytical data, as well as check the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards.

The laboratories apply the letter 'J' to a detection less than the limit of quantitation but greater than the limit of detection; this "flagged" datum is considered an estimated concentration. We reviewed the data using the current ADEC Laboratory Data Review Checklist and applied a standardized set of flags to any data brought into question during the review.

Laboratory QC procedures included evaluating surrogate recovery, performing continuing calibration checks, analyzing method blanks, checking laboratory control samples (LCS), and adding matrix spikes (MS) to assess accuracy and precision. Precision of laboratory analytical procedures is assessed by comparing results of an LCS pair (LCS and LCS duplicate [LCSD]). The laboratory also checks precision by comparing the results of an MS and matrix spike duplicate (MSD).

We reviewed soil analytical results reported by SGS in work order 1148458. The laboratory report and associated ADEC data-review checklist are attached to this report. The following is a summary of our QA/QC review.

Sample Handling

The temperature blank and cooler temperatures were within the recommended range of 0 °C to 6 °C upon receipt of samples in Anchorage. Sample collector (Jake Tracy) did not prepare the COC; he signed the samples over to Shannon & Wilson staff member Valerie Webb, who prepared the COC and delivered the samples to the laboratory. The samples were in Mr. Tracy's possession or securely stored in Shannon & Wilson's office until their delivery to the laboratory for analysis. There were no other sample-handling anomalies.

Analytical Sensitivity

The soil-sample limits of detection for GRO, DRO, BTEX, and PAHs were less than the ADEC soil-cleanup levels. PAH limits of quantitation were elevated for samples *-EX2BS06*, *-EX2BS56*,

-EX2BS07, -LSS07, and *-LSS57* due to sample dilution. Samples were analyzed at dilution due to matrix interference with internal standards.

Laboratory method blanks were analyzed in association with samples collected for this project to check for contributions to the analytical results possibly attributable to laboratory-based contamination. There were no analytes detected in the method blanks.

One trip blank per volatile analysis accompanied the samples to determine if cross-contamination or contamination from an outside source may have occurred during shipment or storage. The trip blanks submitted to the laboratories were analyzed for GRO by Alaska Method AK101 and BTEX by EPA Method SW8021B. No analytes were detected in the trip blank.

Overall, analytical sensitivity was sufficient for the purposes of this investigation.

Accuracy

The laboratory assessed the accuracy of their analytical procedures through a variety of QA procedures. Analysis of matrix spike (MS) and MS duplicate (MSD) samples allowed the laboratory to assess the accuracy of their procedures by checking their ability to recover analytes added to field samples with matrices similar to our project samples. They also analyzed laboratory control samples (LCSs) and LCS duplicates (LCSDs); they are similar to MS/MSD samples, but evaluate the laboratory's ability to recover analytes added to clean matrices, as opposed to field samples. The laboratory accuracy was also evaluated for each sample by assessing recovery of analyte surrogates added to individual project samples.

MS/MSD and LCS/LCSD recoveries were within laboratory-control limits for the project samples with the following exception:

- There were MSD recovery failures for *o*-xylene for samples due to matrix interference. The samples spiked were not samples from this project, so our results are unaffected by the recovery failures. The LCS/LCSD recoveries were within limits and are used to assess accuracy.

The surrogate recoveries were within acceptance criteria with the following exceptions:

- The GRO surrogate recoveries did not meet QC criteria (biased high) due to matrix interferences for samples *-EX2BS01, -EX2BS51, -EX2BS06, -EX2BS56, -EX2BS07, -EX2BS13, -EX2BS16, -EX2SW04, -EX2SW05, -EX2SW08, -EX1BS02, -EX1SW01, -EX1SW51, -LSS07, -LSS57, -LSS08, -LSS24, -LSS33, -LSS36,* and *-LSS43*. The GRO results for these samples are considered biased high.

- The DRO surrogate recovery was outside QC criteria due to sample dilution for samples *-EX2BS01, -X2BS51, -EX2BS06, -EX2BS56, -EX2BS07, -EX2BS13, -EX2BS16, -EX2SW04, -EX2SW05, -EX2SW08, -EX2SW09, -EX2SW17, -EX1BS02, -EX1SW01, -LSS57, -LSS08, -LSS24, -LSS33, -LSS36,* and *-LSS43*. The associated sample results are unaffected by surrogate failures due to dilution.
- The PAH surrogate recoveries were above QC criteria due to sample dilution for samples *-EX2BS06, -EX2BS56, -EX2BS07,* and *-LSS57*. The associated sample results are unaffected by surrogate failures due to dilution.

Aside from those instances noted above, the surrogate recoveries for the soil samples were within laboratory- or method-established limits, indicating the analyses were accurate. Overall, the soil-sample data for this project are considered to be accurate, and are usable as qualified.

Precision

We collected five sets of duplicate samples to evaluate the precision of analytical measurements and the reproducibility of our sampling technique. The duplicate-sample sets were *-LFS01/-LSS50, -EX2BS01/-EX2BS51, -EX2BS06/-EX2BS56, -EX1SW01/-EX1SW51,* and *-LSS07/-LSS57*.

To evaluate precision of the soil data, we calculated the relative percent difference (RPD; the difference between the sample and its field duplicate divided by the mean of the two); RPD can be evaluated only if the results of the analysis for both the sample and its duplicate exceed the method-detection limits.

The RPDs for GRO were greater than the data-quality objective of 30 percent for samples *-LSS07/-LSS57*; and the RPDs for toluene, *o*-xylene, and p&m-xylenes were greater than the data-quality objective of 50 percent for samples *-LSS07/-LSS57*. The affected analyte concentrations in these samples are considered to be estimates, and are flagged "J*" to indicate data imprecision. The elevated RPDs are believed to be due to matrix variations between the two soil samples.

Laboratory analytical precision can also be evaluated by RPD calculations. The laboratory MS/MSD RPDs and LCS/LCSD RPDs provide information regarding the reproducibility of their procedures and are therefore a measure of analytical precision. The MS/MSD RPDs and LCS/LCSD RPDs for the analyses fell within the laboratory- or method-established limits with the following exception:

- The PAH MS/MSD RPD for benzo(a)pyrene (laboratory sample 1144270001 MSD) does not meet QC criteria. The sample spiked for this analysis was not part of our project sample set, so the RPD failure does not affect the data quality.

Except for the imprecision of the data noted above, the data are considered usable for the purposes of this project.

Data Quality Summary

By working in accordance with our proposed scope of services, the samples we collected are considered to be representative of site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to QC failures, and our completeness goal of obtaining 85 percent useable data was met. In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities and is adequate for the purposes of our assessment.

The laboratory report for the project's samples, including the case narrative describing the laboratory QA results in detail, are included with the ADEC laboratory-review checklist as attachments to this report.

APPENDIX F

CONCEPTUAL SITE MODEL SCOPING AND GRAPHIC FORMS

Print Form

Human Health Conceptual Site Model Scoping Form

Site Name: Former Tanana Power Company Site

File Number: 780.57.003, 780.38.014

Completed by: Shannon & Wilson, Inc.

Introduction

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

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

1. General Information:

Sources *(check potential sources at the site)*

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

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

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

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

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

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

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

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

If the box is checked, label this pathway complete: Complete

Comments:

Soil samples collected at the Site show the presence of contaminants in the uppermost 9 feet bgs.

2. Dermal Absorption of Contaminants from Soil

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

Three PAH analytes are present above SCLs.

b) Ingestion -

1. Ingestion of Groundwater

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

The only site-specific groundwater datum is a sample collected from a test pit excavated to 24.5 feet bgs in 2010. ADEC institutional controls prohibit the installation of a groundwater well on the property. The ingestions of groundwater pathway, while complete, is controlled.

2. Ingestion of Surface Water

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

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

If both boxes are checked, label this pathway complete: Incomplete

Comments:

Sampling of the groundwater-surface water interface 100 feet from the site in 2012 indicated that contamination is not migrating to surface water (i.e. the Yukon River).

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Comments:

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

Benzene and three PAH analytes are present about SCLs.

2. Inhalation of Indoor Air

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

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

If both boxes are checked, label this pathway complete: Complete

Comments:

Benzene and three PAH analytes are present about SCLs.

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

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

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

Comments:

Pore-water sampling at the edge of the Yukon River in 2012 found no contamination. Surface water runoff into the Yukon River does not provide a potential dermal exposure pathway due to the depth of contaminated soil.

Inhalation of Volatile Compounds in Tap Water

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

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

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

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

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

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

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

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

Comments:

Direct Contact with Sediment

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

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

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

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

Comments:

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

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Former Tanana Power Company Site
Hazard ID 3946, ADEC File No. 780.57.003, 780.38.014

Completed By: Shannon & Wilson, Inc.
Date Completed: January 2015

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

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media	Transport Mechanisms	
☐ Surface Soil (0-2 ft bgs)	Direct release to surface soil	check soil
	☐ Migration to subsurface	check soil
	☐ Migration to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Runoff or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☑ Subsurface Soil (2-15 ft bgs)	Direct release to subsurface soil	check soil
	☑ Migration to groundwater	check groundwater
	☑ Volatilization	check air
	☑ Uptake by plants or animals	check biota
	☐ Other (list):	
☑ Ground-water	Direct release to groundwater	check groundwater
	☑ Volatilization	check air
	☑ Flow to surface water body	check surface water
	☐ Flow to sediment	check sediment
	☑ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Surface Water	Direct release to surface water	check surface water
	☐ Volatilization	check air
	☐ Sedimentation	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Sediment	Direct release to sediment	check sediment
	☐ Resuspension, runoff, or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ soil	☑ Incidental Soil Ingestion				C/F			
	☑ Dermal Absorption of Contaminants from Soil				C/F			
	☐ Inhalation of Fugitive Dust							
☑ groundwater	☑ Ingestion of Groundwater							
	☑ Dermal Absorption of Contaminants in Groundwater							
	☐ Inhalation of Volatile Compounds in Tap Water							
☑ air	☑ Inhalation of Outdoor Air			C/F	C/F			
	☑ Inhalation of Indoor Air	F	F	F	F			
	☐ Inhalation of Fugitive Dust							
☑ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ sediment	☐ Direct Contact with Sediment							
☑ biota	☐ Ingestion of Wild or Farmed Foods							

01/22/2015

APPENDIX G

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Attachment to and part of Report: 31-1-11697-103

Date: May 27, 2015

To: Mr.Dennis Harwood, ADEC

Re: 2014 Corrective Action Report, City of Tanana New Building Excavation, Fmr Tanana Power Company Site

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

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

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

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

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

SUBSURFACE CONDITIONS CAN CHANGE.

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

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

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

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

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

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

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

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

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

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

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

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

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