
# FINAL ENVIRONMENTAL ASSESSMENT

Alaska Cargo Cold Storage Project April 2024

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This Environmental Assessment becomes a federal document when evaluated, signed, and dated by the Responsible FAA Official.

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4/30/2024
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# ACRONYMS & ABBREVIATIONS

ADEC ........ Alaska Department of Environmental Conservation
AEDC ........ Anchorage Economic Development Corporation
AFFF ........ Aqueous Film Forming Foam
AIAS ........ Alaska International Airport System
AJD ........ Approved Jurisdictional Determination
ALP ........ Airport Layout Plan
ANC ........ Ted Stevens Anchorage International Airport
AOA ........ Airport Operations Area
APE ........ Area of Potential Effect
AWMP ........ Anchorage Wetlands Management Plan
CAA ........ Clean Air Act
CEQ ........ Council on Environmental Quality
CFR ........ Code of Federal Regulations
CWA ........ Clean Water Act
dB ........ decibel
DNL ........ Day-Night Average Sound Level
DOT&PF ........ State of Alaska Department of Transportation and Public Facilities
EA ........ Environmental Assessment
EPA ........ U.S. Environmental Protection Agency
FAA ........ Federal Aviation Administration
GHG ........ Greenhouse Gas
HFC ........ Hydrofluorocarbon
IC ........ Institutional Controls
LUST ........ Leaking Underground Storage Tank
MOA ........ Municipality of Anchorage
NAAQS ........ National Ambient Air Quality Standards
NEPA ........ National Environmental Policy Act
NHPA ........ National Historic Preservation Act
PFAS ........ per- and -polyfluoroalkyl substances
PFOA ........ Perfluorooctanoic acid
PFOS ........ Perfluorooctanesulfonic acid
SHPO ........ State Historic Preservation Office

SIP ........................................................................................ State Implementation Plan
SWPPP ........................................................................ Storm Water Pollution Prevention Plan
USACE ........................................................................ United States Army Corps of Engineers
USDA ........................................................................ United States Department of Agriculture
USDOT ........................................................................ United States Department of Transportation
USFWS ........................................................................ United States Fish and Wildlife Service

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# EXECUTIVE SUMMARY

Alaska Cargo and Cold Storage, LLC, under lease with Ted Stevens Anchorage International Airport (ANC), and in cooperation with the Federal Aviation Administration (FAA) proposes to construct an energy-efficient, climate-controlled air cargo warehouse facility and hardstand parking for cargo jets at ANC. The proposed development features may include the following:

- New Aircraft Parking Apron
- Climate-controlled Cargo Warehouse
- Hardstand Fuel Distribution
- Ground Support Equipment Shop and Parking
- Ancillary Space
- Road Connection to Postmark Drive

The proposed project will be incorporated into the Alaskan Airports Division Airport Layout Plan (ALP) and will require approval from the Federal Aviation Administration (FAA), and is subject to the National Environmental Policy Act (NEPA). Therefore an Environmental Assessment (EA) is being prepared.

A review was undertaken of the existing environmental conditions using the most current available data to identify potential environmental resources within the proposed project vicinity. This Draft EA describes the baseline conditions of resources that may be affected by the alternatives under review, including the Proposed Action and the No-Action alternatives. This Draft EA also discusses impacts to the existing environment resulting from the alternatives under review. Resources potentially affected by the Proposed Action included Air Quality, Biological Resources, Climate, Hazardous Waste, Historic and Cultural Resources, Noise, Visual Resources, Water Quality, and Wetlands. The evaluation of project impacts to protected resources show that no environmental resources will incur significant impacts as outlined in FAA by significance thresholds in FAA Order 1050.1F Section 4-3.3.

Scoping for the project was completed from May 29, 2022 to July 15, 2022. Comments received from public and agencies were incorporated into the Draft EA. The Draft EA was published for public and agency review on September 4, 2023 to open the public comment period which concluded October 15, 2023. A public meeting was held on October 3, 2023. Comments received from the public and agencies were incorporated into this Final EA. Please see Appendix G for a comment response log and reference to where in the Final EA changes were made. Changes include a sovereign nation government to government outreach summary, a brief discussion on the traffic conditions, revising the alternatives analysis to include Taxiway Zulu construction and NorthLink Aviation construction, revising the cumulative analyses to specifically include the adjacent FedEx proposal, and revising the the Climate Change section to conform with updated CEQ guidance.

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# 1.0 PROPOSED ACTION

Alaska Cargo and Cold Storage, LLC, under lease with Ted Stevens Anchorage International Airport (ANC), and in cooperation with the FAA proposes to construct infrastructure for climate-controlled cargo warehouse facilities at ANC.

Alaska Cargo and Cold Storage holds a 55-year lease for approximately 29 acres of airport land and is proposing to develop critical airport infrastructure to support growing cargo volumes at ANC. The proposed project features may include the following:

- New Aircraft Parking Apron (eight hardstands)
- Climate-controlled Cargo Warehouse
- Hardstand Fuel Distribution
- Ground Support Equipment Shop and Parking
- Ancillary Space
- Road Connection to Postmark Drive

The proposed project location is on the east side of the airport; east of Runway 15/33, south of Taxiway P, west of Postmark Drive, and north of the Aircraft Rescue and Fire Fighting Station. The area is in Section 28, Township 13N, Range 4W, Seward Meridian; U.S. Geological Survey Quad Anchorage A-8 NW (Figure 1).

The proposed project will be incorporated into the Alaskan Airports Division Airport Layout Plan (ALP). The State of Alaska Department of Transportation and Facilities (DOT&PF) is responsible for appropriate airport planning[1], which includes proposed updates to an ALP. ALPs are drawings used to depict current and future airport facilities. The ALP serves as a record of present and future aeronautical requirements and is a blueprint for airport development by which the airport authority and FAA can ensure that all proposed development is consistent with FAA airport design standards and safety requirements as well as airport and community land use plans.[2] Some proposed improvements require ALP approval from the FAA, and are therefore subject to the National Environmental Policy Act (NEPA). FAA completed a Section 163 determination of the Alaska Cargo and Cold Storage project on May 3, 2022 and found project components subject to FAA ALP approval include the new aircraft parking apron (Appendix A). The Section 163 determination found the other project components are not subject to FAA ALP approval, however FAA Guidance on Section 163 determinations state that if any project component is subject to NEPA, then the entire project is subject to NEPA (FAA 2022).

To meet the requirements identified above a Final Environmental Assessment (EA) is being prepared. The Final EA serves to evaluate the environmental effects of the Proposed Action,

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[1] Airport planning is integral and necessary to ensure efficient development at civil airports that is consistent with local, state, and federal requirements, guidelines and goals. A key objective of airport planning is to assure the effective use of airport resources to satisfy aviation demand in a financially feasible manner.
[2] An up-to-date FAA-approved ALP ensures the safety, utility, and efficiency of the Airport and is required when an Airport is seeking financial assistance from the FAA.

which are discussed further in Chapter 3. Construction is anticipated to begin in 2025 and all improvements are anticipated to be complete within two years.

This Final EA has been prepared in accordance with NEPA (42 U.S.C. 4321), the Council of Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500 et seq.), and requirements and guidance specific to FAA found in FAA Order 1050.1F (2015) and Order 5050.4B (2006).


*Figure 1 Location and Vicinity*

**Existing Conditions**

ANC is located in Alaska's most populous city, Anchorage. Within Anchorage, ANC occupies the most western point of land, adjacent to Cook Inlet. The DOT&PF owns and operates ANC. The 4,210-acre ANC complex (excluding Lake Hood) features three runways, one helipad, 19 taxiways, and two terminals. Approximately 45 air carriers operate out of ANC, including 18 domestic and 27 international with an average of 793 flights per day as of 2019 (DOT&PF 2022).

In addition to passenger service, ANC is also a major cargo hub. As of October 2023, ANC has 22 airport-controlled hardstands publicly available for commercial cargo use. These 22 hardstands include: 3 "Papa" hardstands, 11 "Romeo" hardstands. In addition, eight gates at the North Passenger Terminal are not dedicated for, but periodically used as commercial cargo parking. In addition, a private terminal owned by UPS has six hardstands that can accommodate freighters. The cold storage facilities that currently exist on airport property are facilities for cargo forwarding which moves freight from the producer to the user; the cold storage facilities are not available for commercial cargo storage and transfer. As of 2023, ANC ranked as the third busiest airport in the world for cargo traffic. The Anchorage Economic Development Corporation (AEDC) states on their website that the airport is an important contributor to Alaska's economy, and because ANC is 9.5 hours from 90 percent of the industrialized world, it is a critical link for the international movement of goods (AEDC 2022).

The 29 acres of leased airport land that Alaska Cargo and Cold Storage proposes to develop is mostly level, vegetated, and generally undeveloped (Figure 2). There are currently no buildings or site improvements that require electricity, gas, sanitary sewer, or water services. The site is accessed via North Tug Road, which parallels Postmark Drive. The majority of the site consists of wetlands, characterized as freshwater emergent and freshwater forested/shrub emergent wetlands. Most of the property is located outside of the secured Airport Operations Area (AOA). The approximately eight acres located inside the AOA are unvegetated and used for off-spec soil disposal and Airport Rescue & Fire training. The site can be viewed from the North Tug Road. It is located approximately 0.75 miles from the main ANC south terminal and one mile from the Knik Arm of Cook Inlet.

The land for the proposed project was acquired through two deeds, Tract II a patent deed transferred on January 9, 1967 through the Federal Airport Act instrument of transfer and Tract IV a patent deed transferred on August 30, 1961 through the Alaska Statehood Act. Because the land associated with this project within Tract II was acquired with federal funds, under Section 163(b) of the Act, the FAA has the legal authority to approve or disapprove the use of the land associated with this project. The remainder of the land is under FAA grant funding and is also subject to Section 163(b) of the Act. The purpose of the proposed development is consistent with the ALP's intended use of the land. Therefore, the FAA will not require a release of obligations in order to maintain the use of the subject parcel as depicted on the currently approved ALP.


*Figure 2 Proposed Project Area*

## 1.1 Purpose and Need

The identification of the purpose and need for a proposed project is the primary basis for developing the range of reasonable alternatives. The proposed project will develop facilities at ANC for a climate-controlled cargo warehouse, additional cargo parking spaces, and ancillary infrastructure for operations. The following provides a description of the deficiencies and needs that the proposed project would address. The purpose and need of the Federal Aviation Administration's (FAA) action is to evaluate the Alaska Department of Transportation & Public Facilities (DOT&PF) request to update their ALP associated with the proposed cargo and warehouse facilities and meet its statutory obligations under 49 U.S.C. 47101 and Section 163 of the 2018 FAA Reauthorization Act.

### 1.1.1 Purpose of the Proposed Action

The purpose of the proposed project is to construct an energy-efficient, climate-controlled air cargo warehouse facility and hardstand parking for cargo jets at ANC. The purpose of the cargo facilities is to help improve cargo deplaning and enplaning efficiency, provide parking locations for cargo jets where they can power down, and build Alaska's economy. The project would provide a facility for storing goods prior to enplaning on another carrier, or prior to distribution in the state. It would help grow Alaska's economy by providing a much-needed climate-controlled facility for goods being transferred to and exported from the state. The proposed project would be the only leasable large-scale air cargo warehouse facility with aircraft parking to be developed at ANC that is in close proximity to the bulk of current ANC cargo aircraft parking and operations. It would increase operational efficiencies through new and improved cargo and airline support facilities, offer climate-controlled warehousing, and meet FAA and airport safety requirements.

### 1.1.2 Need for the Proposed Action

Unlike airports in other US cities of comparable population size, most activity at ANC revolves around the provision of services to the international air cargo industry. ANC now ranks number four in the world for total weight of all cargo moving through an airport and has been in the top 10 globally for at least 20 years.

Transpacific Efficiency Need: The Covid 19 pandemic created significant challenges and disruptions to global trade flows, leading to high prices, significant delays, and congestion for Transpacific air and marine cargo operations. While the effects of the pandemic have begun to subside, thereby reducing congestion, the long-term trend of strong growth remains; Boeing's 2022 World Air Cargo Forecast projects air cargo between East Asia and North America will grow at 4.4% annually through 2041. In particular, growth in food-related products from North America to Asia grew by 33% between 2011 and 2021, as a share of total tonnes. According to 2022 data from the Airports Council International (Airports Council International, 2022), the aggregate tonnage among the world's top 10 busiest cargo airports increased 15 percent year-over-year. Although ANC 2022 cargo was down 4.3 percent versus 2021, it was still up 26 percent versus 2019 to approximately 3.5 million tons of cargo (Airports Council International, 2023). Airports Council International attributes the decline to the ongoing geopolitical tensions and disruptions to global trade and supply chains. The AEDC is projecting eight percent growth through 2023, and annual tonnage increases in the two percent range each year thereafter (AEDC 2020).

Transpacific Logistics Hub: Located at the midpoint between Asia and North America, ANC is the third busiest cargo airport in the world. Most of the business at ANC is from trans-Pacific flights stopping to refuel when carrying heavy payloads. Currently, there is no place for goods and equipment to be unloaded beyond proprietary facilities (e.g., UPS and FedEx); therefore, the airport functions as a 'gas-and-go' facility for other commercial air cargo carriers. This project is a key component needed to turn ANC into a global logistics hub. Currently there is insufficient climate-controlled storage in Alaska to make it competitive as a Transpacific hub. Cold goods, including fish and seafood, produce, and pharmaceuticals, must be stored in Washington. The proposed project will enable a more efficient transfer of goods and equipment between planes at ANC through the creation of holding facilities, which would increase the efficiency of international and domestic cargo shipments. Further, this major investment in air cargo transfer is expected to provide a foundational enterprise which other companies will build upon.

State of Alaska Economic Need: Sustainable economic growth is a goal of the State of Alaska. Introducing new cargo facilities, such as hardstands and climate-controlled warehouses, will not only meet the immediate demand described above, but will also support and encourage projected long-term growth by transforming ANC from a fuel stop and crew-change site, to an all-purpose site where cargo carriers can efficiently deplane and enplane cargo, including temporarily storing cargo in a warehouse. The improvement in cargo facilities, particularly climate-controlled facilities, is also expected to make ANC more competitive and make Alaska a more desirable transpacific cargo hub. Alaska Cargo and Cold Storage facilities would create long-term economic growth in Alaska by creating permanent job opportunities in numerous construction and operational job sectors and bringing hundreds of millions of dollars into the local economy. ANC presently supplies one in 10 jobs in Anchorage and generates $1.84 billion in economic benefit (Ted Stevens Anchorage International Airport, 2022).

ANC On-Airport Needs: As Transpacific air cargo volumes have grown, ANC has become a leading air cargo airport, creating a need for additional infrastructure to park and service planes, and store and move cargo. ANC is currently limited to the private domestic cargo carriers' warehouse and transfer facilities, none of which are leasable. The current on-airport cold storage is limited and largely confined to proprietary facilities; as such, there is limited ability to transship perishable and temperature-sensitive goods at ANC, and delays may result in loss of cargo. International cargo currently has limited holding locations, let alone climate-controlled for perishable cargo. Currently, perishable materials remain on aircrafts until the receiving aircraft arrives. A climate-controlled facility will allow for cargo to be offloaded from an aircraft, reducing the time an aircraft must wait for the receiving aircraft. As stated above, the cargo industry is a growing sector of ANC and airport cargo infrastructure is now beyond capacity during peak times, with anticipated decreases in capacity on the horizon. According to the 2023 Alaska International Airport System (AIAS) Annual Report (AIAS 2023), the AIAS sees growth in international passenger and cargo operations as well as intra-Alaska air operations. ANC has 22 airport-controlled hardstands, 14 of which are publicly available for commercial cargo use. Eight gates at the North Passenger Terminal are not dedicated to but are periodically used as commercial cargo parking. In addition, a private terminal owned by UPS has six hardstands that can accommodate freighters is expected to expand and reduce available hardstands by six (UPS hardstands are no longer available for third party lease). Further, anticipated growth of international passenger traffic would likely remove ANC's North Passenger Terminal as an option for cargo freighter parking (Ted Stevens Anchorage International Airport, 2014). One air cargo development (NorthLink Aviation) is currently under construction with an anticipated 15 hardstands to be added and available for lease, however ANC has added four new cargo carriers in 2023 and 2024. In sum, ANC is unlikely to have enough cargo aircraft parking and cargo facilities to meet current and future demands even when considering the addition of 15 hardstands under construction.

## 1.2 Federal Action Requested

The Federal Action requested of the FAA by the Sponsor is to approve ALP amendments for a new aircraft parking apron to provide connections required for Alaska Cargo and Cold Storage cargo and warehouse development. There are no proposed modifications to FAA Design Standards included in this project.

# 2.0 ALTERNATIVES

This chapter both describes the alternatives and compares the alternatives in terms of their environmental impacts and their achievement of the objectives described above in the purpose and need.

The nature of the proposed action determines the range of reasonable alternatives. (FAA Order 1050.1F at 6-2.1.) There is “no requirement for a specific number of alternatives or a specific range of alternatives to be include in an EA.” (FAA Order 1050.1F at 6-2.1.)

What is proposed is a privately funded development on a particular lease lot primarily to accommodate cargo operations. Alaska Cargo and Cold Storage does not presently have the ability to develop a different area at ANC for cargo operations.

## 2.1 No-Action

Under the No Action Alternative, there would be no development of the Alaska Cargo and Cold Storage property and the site would remain unutilized airport property. The No-Action alternative would not meet the project’s purpose and need.

As detailed in Section 1.1.2., projected growth of cargo operations at ANC in comparison with number of publicly available or leasable hardstands shows that ANC would remain over-capacity for cargo resources and the cargo infrastructure need for additional climate-controlled warehouse space would remain unmet. Furthermore, inefficiencies may increase in the future due to the forecast increase in cargo operations at ANC, or demand for ANC as a cargo hub may diminish due to the lack of cargo and climate-controlled warehouse infrastructure.

Under the No-Action alternative, it is also reasonably foreseeable that the Alaska Cargo and Cold Storage site will be developed otherwise for similar aeronautical purposes. FAA Order 5190.6B (Change 1, Nov. 2021) limits ANC’s ability to allow nonaeronautical uses on land designated for aeronautical purposes, such as the Alaska Cargo and Cold Storage site.

## 2.2 Proposed Action (Preferred Alternative)

The Proposed Action is the preferred alternative because it is expected to meet the project purpose and need. The Proposed Action will develop the Alaska Cargo and Cold Storage site to accommodate the growing need for cargo and climate-controlled warehouse infrastructure at ANC. It is anticipated to meet the project purpose and need by meeting the ANC demand for additional climate-controlled cargo warehouse, hardstand parking, and other ancillary uses.

The site for the Proposed Action was selected because it is located at ANC within the Foreign Trade Zone and in close proximity to the main cargo ramp, aircraft parking positions, and adjacent cargo operations that presently lack commercially available climate-controlled warehousing..

The Proposed Action may include the following components (Figure 3) and is described in further detail below:

- New Aircraft Parking Apron (eight hardstands)
- Climate-controlled Cargo Warehouse

- Hardstand Fuel Distribution
- Ground Support Equipment Shop and Parking
- Ancillary/Control Space
- Road Connection to Postmark Drive

A new, approximately 29-acre concrete pad would be constructed to support the warehouse, parking apron, possible hardstand fueling locations, airside and landside loading areas, outdoor storage, vehicle parking, and emergency and maintenance vehicle access around the building. Prior to the placement of the pad, the site would be cleared, and overburden would remain on site mostly undisturbed. Additional details on preliminary design are shown in Appendix E, Wetlands (pages E-12 through E-18).

The new aircraft parking apron will include a paved surface with up to eight hardstands. The hardstands may be equipped with in-ground fuel hydrants (supplied by transportation pipelines located east of runway 15/33) and in-ground power connections. Taxilanes connect the aircraft parking apron to the north/south runway 15/33 via existing taxiways. The warehouse facility pad would have various design elements depending on function, including driving aisles and parking areas which would connect the warehouse to North Tug Road and Postmark Drive. As proposed, the warehouse would support climate-controlled cargo storage, and provide ancillary functions, such as offices. The building would be pile-supported.

For water and sewer utilities within the area trenches to the buildings would be excavated prior to placement of the concrete pad. Utilities under the proposed building would hang from the building's concrete structural foundation and would not require trenching. Electricity and telephone/internet would be “ditch witched” in small trenches to the buildings.

Staging and stockpiling will occur on the site in areas designated for development. Material would be sourced from local permitted sites and trucked in using existing roads. No improvements to roads would be necessary to truck in fill. Excavated materials, which will only result from trenching for utilities will be backfilled in the original locations.

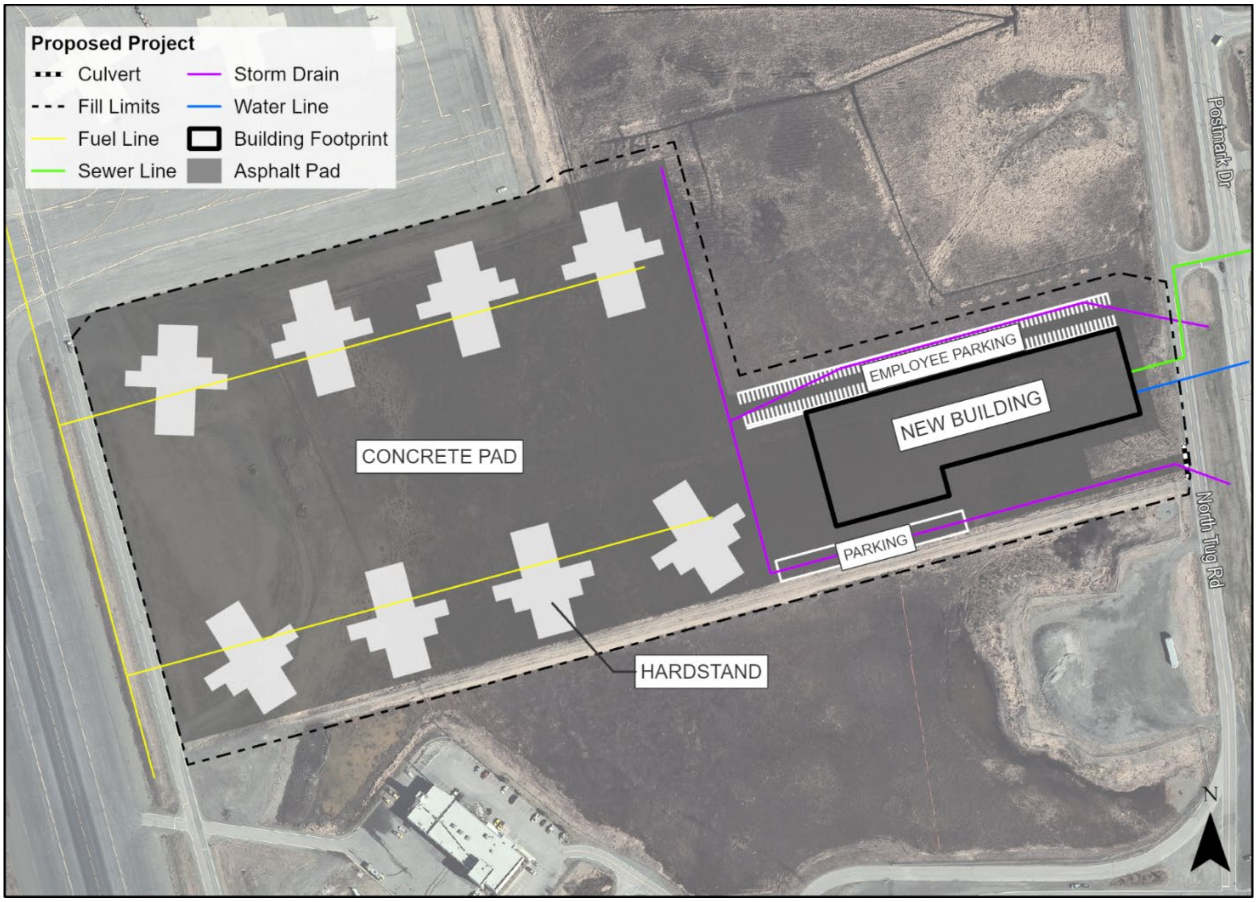


*Figure 3 Proposed Action*

## 2.3 Alternatives Development and Comparison

Alternatives developed and evaluated under this project include the No-Action alternative and the Proposed Action preferred alternative. The No-Action alternative represents baseline conditions from which the environmental impacts of the Proposed Action can be measured.

In order for an alternative to be considered, it must be reasonable, feasible, and meet the project's purpose and need. Alternatives that were considered for analysis under the purpose and need were limited to ANC property. The purpose of any proposed development would be to develop infrastructure to efficiently support air cargo and climate-controlled warehousing operations at ANC. Off-site locations to develop such infrastructure would not be reasonable or feasible. Design measures to avoid or minimize impacts of the Proposed Action were not considered alternatives, rather design changes, because the project variations all largely have the same footprint and location.

### 2.3.1 Alternatives Considered but not Carried Forward

Alternatives that were considered for analysis under the purpose and need were limited to ANC property. The purpose of any proposed development would be to develop infrastructure to allow for efficient movement between aircraft and the facility and efficiently support air cargo operations at ANC. Locations outside ANC were dismissed primarily because of inefficient, or potentially complete lack of, access to the cargo carriers needing to enplane and deplane cargo. Locations outside of ANC were also dismissed because they were not within the Foreign Trade Zone. It is essential the proposed development be completely located on ANC property, which is a Foreign Trade Zone, in order to take advantage of air cargo transfer rights granted by the U.S. Department of Transportation (USDOT). Additionally, air cargo needs to be located near aircraft hardstands, and aircraft hardstands need to be located near existing taxiways. Therefore, off-site alternative locations to develop the proposed project would not be reasonable or feasible. In addition, the cargo transfer includes deplaning and enplaning on another carrier, or deplaning and distribution in the state. As such, the facility would be required to be adjacent other cargo facilities and adjacent a publicly accessible road.

Figure 4 shows the layout of ANC Airparks and land already leased to other entities. Alternative locations for the proposed cargo and climate-controlled facilities are listed below and a description of the feasibility of each location. For those alternatives that were considered technically feasible, screening criteria developed from the purpose and need statement to determine if the alternatives are reasonable. Screening criteria are shown in South Airpark

South Airpark is located between the Sand Lake Neighborhood and the east/west runways in


*Figure 4 ANC Existing leases*

the southern portion of the airport. The South Airpark currently has a leaseholder for the undeveloped land adjacent Taxiway Zulu. South Airpark is largely developed or leased (NorthLink Aviation). Land to the west of the NorthLink Aviation lease lot is very near and overlaps Kincaid Park, a 4(f) protected resource. In addition, the location is distant from existing commercial cargo carriers, which largely operate in North Airpark. The location would result in inefficiencies for enplaning and deplaning due to the travel required from South Airpark to North Airpark. The size of available undeveloped land however, and the adjacency to a Taxiway Zulu extension currently under construction result in South Airpark being considered **technically feasible**.

#### *2.3.1.1 West Airpark*

West Airpark is generally undeveloped land on ANC property located west of the north/south runways. The ALP shows future conditions for the West Airpark to include and additional north/south runway, additional taxiways, and roads (Ted Stevens Anchorage International Airport 2014). The north/south runway is proposed to be sited through the middle of the West Airpark, however substantial space still exists for cargo infrastructure; the location is **technically feasible** for cargo facilities. Limiting factors are that the location is not adjacent existing air cargo hardstands limiting the practicality of air cargo transfer, and the perimeter road would need to be relocated.

#### *2.3.1.2 North Airpark*

North Airpark currently has limited undeveloped land available for additional cargo infrastructure. One location adjacent Point Woronzoff Drive is undeveloped and available for lease, however due to the size and shape, the location would have operational challenges for maneuvering aircraft on-site so the location was considered **not feasible** for the Proposed Action. Other undeveloped/unleased land exists east of Postmark Drive, however that location would not have access to runways or taxilanes. Additionally, the land east of Postmark Drive is largely wetlands of higher quality than those at the Proposed Action site. The North Airpark east of Postmark Drive was considered **not feasible** due to the tremendous infrastructure changes that would be required to connect the location to taxiways and runways.

Table 1 as well as the viability analysis. The only viable alternative beyond the No-Action is the Proposed Action.

#### *2.3.1.3 South Airpark*

South Airpark is located between the Sand Lake Neighborhood and the east/west runways in the southern portion of the airport. The South Airpark currently has a leaseholder for the undeveloped land adjacent Taxiway Zulu. South Airpark is largely developed or leased (NorthLink Aviation). Land to the west of the NorthLink Aviation lease lot is very near and overlaps Kincaid Park, a 4(f) protected resource. In addition, the location is distant from existing commercial cargo carriers, which largely operate in North Airpark. The location would result in inefficiencies for enplaning and deplaning due to the travel required from South Airpark to North Airpark. The size of available undeveloped land however, and the adjacency to a Taxiway Zulu extension currently under construction result in South Airpark being considered **technically feasible**.

#### *2.3.1.4 West Airpark*

West Airpark is generally undeveloped land on ANC property located west of the north/south runways. The ALP shows future conditions for the West Airpark to include and additional north/south runway, additional taxiways, and roads (Ted Stevens Anchorage International Airport 2014). The north/south runway is proposed to be sited through the middle of the West Airpark, however substantial space still exists for cargo infrastructure; the location is **technically feasible** for cargo facilities. Limiting factors are that the location is not adjacent existing air cargo hardstands limiting the practicality of air cargo transfer, and the perimeter road would need to be relocated.

#### *2.3.1.5 North Airpark*

North Airpark currently has limited undeveloped land available for additional cargo infrastructure. One location adjacent Point Woronzoff Drive is undeveloped and available for lease, however due to the size and shape, the location would have operational challenges for maneuvering aircraft on-site so the location was considered **not feasible** for the Proposed Action. Other undeveloped/unleased land exists east of Postmark Drive, however that location would not have access to runways or taxilanes. Additionally, the land east of Postmark Drive is largely wetlands of higher quality than those at the Proposed Action site. The North Airpark east of Postmark Drive was considered **not feasible** due to the tremendous infrastructure changes that would be required to connect the location to taxiways and runways.

*Table 1: Alternative Screening Criteria and Viability Analysis for Feasible Alternatives*

| SCREENING CRITERIA | PROPOSED ACTION | WEST AIRPARK | SOUTH AIRPARK |
|---|---|---|---|
| **Lease opportunities for each location** | **Y – A lease has been secured for the proposed action.** | **Y – The West Airpark leasing opportunities are currently pending. Leasing opportunities may become available.** | N – There are no current leasing opportunities for undeveloped land in South Airpark. |
| **ANC Master Plan conditional ALP approval** | **Y – The FAA has conditionally approved the ALP including cargo developments at the Proposed Action location** | **Y – The FAA has conditionally approved the ALP including cargo developments at the West Airpark Location** | N – The ALP shows South Airpark land use west of NorthLink lease lot proposed for “other aviation”. |
| **Access to taxiways and/or runways** | **Y – The proposed action is currently located adjacent a taxiway providing connectivity to runways.** | **Y – The West Airpark location could reasonably be constructed adjacent an existing taxiway.** | **Y – The Taxiway Zulu extension project would provide connectivity to runways.** |
| **Adjacent to roadway and other cargo facilities** | **Y – The Proposed Action location is directly connected to a roadway and adjacent existing cargo facilities.** | N – The West Airpark is located adjacent a roadway, however not adjacent to other cargo facilities or commercial cargo carriers. | **Y – The location will be adjacent NorthLink Aviation cargo facilities proposed and under construction.** |

### 2.3.2 Comparison of Environmental Impacts

Potential environmental impacts are discussed in Chapter 3. Several environmental resources are not expected to be affected by the Proposed Action. Table 2 below, compares the No-Action and the Proposed Action environmental impacts for those environmental resources that the project may affect. A discussion of the environmental resources considered but found to have no impact from the proposed project can be found in Section 3.1.

*Table 2: Comparison of Environmental Impacts by Alternative*

| RESOURCE | NO-ACTION ALTERNATIVE | PROPOSED ACTION ALTERNATIVE |
|---|---|---|
| **Air Quality** | No effect | The proposed action will bring cargo jets and CO2 emissions into a location that does not currently have those conditions. The proposed project will not increase the number of jets at ANC, it is only expected to localize the parking positions at the project area. No increase of emissions of pollutants is expected. |
| **Biological Resources** | Adverse impacts to wildlife will continue due to contaminated habitat. | The proposed project will displace, but benefit avian and terrestrial wildlife that occur on airport property. The property is contaminated with per- and -polyfluoroalkyl substances (PFAS) and wildlife that occupy the property are subject to potentially adverse human interaction (e.g., trapping and removing, or hazing). Wildlife in this area would benefit from utilizing other non-contaminated off-airport property habitat. |
| **Climate** | No effect | The project may have minor impact to the climate. It is not certain whether or not Hydrofluorocarbons (HFCs) will be used for refrigeration, if so, potential HFC emissions will be limited such that an analysis is not even warranted under NEPA. |
| **Hazardous Materials, Solid Waste, and Pollution Prevention** | Site will remain contaminated. Organic compounds (diesel range organics) may attenuate over time, however PFAS compounds will remain and potentially percolate through soils through water recharge. | The project area is contaminated with Perfluorooctanoic acid (PFOA); Perfluorooctanesulfonic acid (PFOS); diesel range organic compounds; residual range organics; and benzene, toluene, ethylbenzene and xylene. Contaminants that will be moved offsite (including contaminated water) will be cleaned prior to removal. The magnitude of contamination is expected to be reduced, however contamination will remain on site. Coordination with Alaska Department of Environmental Conservation is ongoing. |
| **Historic and Cultural Resources** | No effect | No effect. No historic properties were identified in the area of potential effect. Inadvertent discoveries of cultural resources may occur during project construction but are not anticipated due in part to the amount of previous disturbance.<br>Likelihood of encountering buried historic resources is low. |

| RESOURCE | NO-ACTION ALTERNATIVE | PROPOSED ACTION ALTERNATIVE |
|---|---|---|
| **Noise and Noise Compatible Land Use** | No effect | A preliminary noise analysis determined that noise impacts from the project operations are limited to a degree that they don't warrant a detailed analysis as described in FAA Order 1050.1F. No significant noise impacts will occur. |
| **Visual Effects** | No effect | No adverse visual impacts will occur. The proposed project is consistent with existing facilities along Postmark Drive including cargo buildings and government buildings. No scenic viewsheds occur in the vicinity. |
| **Wetlands** | No effect | 22 acres of wetlands permanently impacted. Compensatory mitigation will offset the permanent impacts to wetlands. |

# 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter provides an overview of the existing environment, describing the resources that may be impacted by the proposed alternatives, including the No-Action alternative. Environmental impacts include direct, indirect, and cumulative impacts.

Direct impacts are caused by the Proposed Action and occur at the same time and place.

Indirect impacts are caused by the action that are later in time or farther removed in distance but are still reasonably foreseeable.

Cumulative impacts are the result of incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions.

## 3.1 Environmental Impact Categories Not Affected

The following Federal Aviation Administration (FAA) environmental impact categories were analyzed and determined the resource is not present or there is no potential for impacts.

- **Coastal Resources**
- **Section 6(f) of the Land and Water Conservation Fund Act**
- **Section 4(f) of the USDOT Act**
- **Farmlands**
- **Land Use**
- **Natural Resources and Energy Supply**
- **Socioeconomics and Environmental Justice**

### Coastal Resources

There are no coastal resources within or adjacent to the project area and the State of Alaska does not participate in the Coastal Zone Management Program.

### Section 6(f) of the Land and Water Conservation Fund Act

Section 6(f) properties are those protected by the Land and Water Conservation Fund (LWCF) Act because they were purchased by LWCF money. The list of 6(f) properties is maintained by the Alaska Department of Natural Resources. There are no 6(f) properties within or adjacent the project area.

### Section 4(f) of the USDOT Act

Section 4(f) prohibits using land from publicly owned parks, recreation areas, wildlife and waterfowl refuges, and publicly or privately owned historic sites for transportation projects. The Proposed Action does not occur in or adjacent a 4(f) protected resource. No 4(f) lands will be permanently or temporarily used for the Proposed Action.

### Farmlands

The U.S. Department of Agricultural, Natural Resources Conservation Service Web Soil Survey indicates there is no designated prime or unique farmland, farmland of statewide importance, or farmland/soil of local importance in the project area.

### Land Use

The Proposed Action is consistent with the municipal, state, and federal intended uses for the land. The project area is zoned by the Municipality of Anchorage as Transitional. The project area was leased from State of Alaska ANC specifically for development purposes; the Airport Layout Plan lists the location for future cargo development. The FAA Section 163 determination found the project to be consistent with the intended use of the land, as set forth in 49 U.S.C. §§ 47107(b) and 47133.

### Natural Resources and Energy Supply

Once construction is complete, the proposed airport improvements would not have a measurable effect on the local energy supply or existing natural resources. Energy supply resources include:

- Anchorage Fueling and Service Company for fuel
- Chugach Electric Association for electricity
- ENSTAR for natural gas
- Alaska Communications for telephone
- Anchorage Water and Wastewater Utility for water and sewer

The Proposed Action will utilize measures to reduce the energy consumption required for facility operations. The proposed warehouse and cold storage facility will be Leadership in Energy and Environmental Design (LEED) certified further reducing energy consumption during facility operations through design standards based on energy efficiency.

### Socioeconomics and Environmental Justice

No adverse socioeconomic impacts are expected as a result of the proposed project. The proposed project is surrounded by airport property for approximately three-quarters of a mile on all sides. The Proposed Action will not result in acquisition of property or changes in access to public services. The Proposed Action is not expected to have an effect on the social fabric of local communities. The proposed project will provide a benefit to the local economy through job creation. No adverse impacts to housing, public services, population, or social conditions are anticipated as a result of the Proposed Action. The project is expected to benefit economic activity, employment, and income.

The Proposed Action will not meaningfully impact traffic conditions in the area because the cargo facility is expected to largely operate as enplaning and deplaning cargo on-site, not deplaning for in-state ground transportation. Deplaning cargo for local transport is expected, but very limited and not daily. Trucks that come to and from the site would be routed to International Airport Road.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, directs federal agencies to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. The Executive Order is often referred to as Environmental Justice. A review of the Environmental Protection Agency Environmental Justice Mapper was conducted on October 18, 2023 to capture a one-mile buffer around the project area. The results showed community members within one-mile of the Proposed Action are within the 45th percentile in the State of Alaska for the two EJ indices, minority and low-income. The Proposed Action will not disproportionately effect minority and low-income communities.

Executive Order 13045 directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children. The Proposed Action is located on, and entirely surrounded by, airport property. Children are not expected to frequent the area; the nearest school is approximately 1.25-miles to the east. Due to the distance from schools and other areas that children may frequent, such as playgrounds, the project is not expected to disproportionately effect children's environmental health or create safety risks.

## 3.2 Air Quality

**Regulatory Context**

Air Quality is regulated under the Clean Air Act (CAA) by the U.S. Environmental Protection Agency (EPA). Alaska Department of Environmental Conservation (ADEC) is responsible for implementing general conformity with the national standards through a State Implementation Plan (SIP). The SIP establishes limits and work standards to limit emissions of six criteria air pollutants[3] for which the Environmental Protection Agency (EPA has established National Ambient Air Quality Standards (NAAQS).

### 3.2.1 Affected Environment

The Municipality of Anchorage (MOA) was first declared a nonattainment area for carbon monoxide (CO) in 1978. The MOA currently operates under a limited maintenance plan for carbon monoxide. The proposed action is located outside of the boundaries of the maintenance area and carbon monoxide monitoring network (Figure 5), however due to the proximity emissions of the proposed action will be considered under this EA. According to the 2011 SIP, the primary source of CO is motor vehicles. Operations at ANC account for 7.8 percent of total CO emissions (as of 2007) in the MOA. ANC has an air quality permit through the ADEC and is required to provide annual updates on emissions from operations.

[3] *Sulfur dioxide, particulate matter, nitrogen oxides, lead, carbon monoxide, and ozone.*


*Figure 5 MOA Carbon Monoxide Maintenance Area Boundary*

### 3.2.2 Environmental Consequences

**Significance Thresholds**

The FAA defines the significance threshold for air quality impacts as an action that would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the EPA under the CAA, for the time periods analyzed, or to increase the frequency or severity of any such existing violations.

#### *3.2.2.1 Direct and Indirect Impacts*

**No-Action**

The No-Action alternative would have no effect on air quality.

**Proposed Action**

The magnitude of operations at ANC are not expected to change as a result of the ACCS improvements, particularly not vehicular movements which are the primary contributor of carbon monoxide and nitrous oxides. New ground service equipment, such as container loaders or service vehicles, may be introduced to service cargo jets, however the emissions from such vehicles would be negligible. The project is not expected to emit the remaining four criteria air pollutants. The proposed climate-controlled warehouse will be Leadership in Energy and Environmental Design (commonly referred to as LEED) certified, a global recognition that the design adheres to climate and air quality benchmarks. As relates to the significance threshold, there are no existing violations of air quality standards in the proposed project area and the proposed action will conform with LEED air quality standards, which provides limitations for emissions to meet the standards. The introduction of new carbon monoxide emissions from the proposed action would result from new water heaters and furnaces in the climate-controlled warehouse. New water heater(s) and a furnace(s) are not expected to lead to substantial carbon monoxide emissions and Anchorage meets the air quality standards for all six criteria air pollutants. Construction would temporarily result in a minor increase in air pollutant emissions from earth moving activities and construction equipment emissions. However, the Proposed Action is in an area that is in attainment for all air pollutants and construction would be temporary. Dust during construction would be regulated using Best Management Practices (BMPs) and compliance with the Alaska Pollutant Discharge Elimination System Construction General Permit. Therefore, the Proposed Action is not expected to result in an exceedance of any air quality pollutants based on NAAQS standards. Due to the temporary nature of construction and the size of the Proposed Action, the Proposed Action would not result in significant air quality impacts.

The proposed climate-controlled facility will require refrigeration and will likely emit hydrofluorocarbons (HFCs), which are a known contributor to global climate change. HFCs are not regulated under the NAAQS, and as such the impact of HFC emissions and regulatory context will be discussed in the climate change section (3.4).

#### *3.2.2.2 Cumulative Impacts*

Air emissions have increased over time with the development of ANC. Other present actions contributing similar NAAQS emissions include ground service equipment operations at terminal gates and ground service equipment at other cargo facilities such as FedEx, UPS, and ACE

Cargo. FedEx is currently planning a development adjacent to the Proposed Action. Operation of the FedEx facility would not increase emissions or the amount of surface vehicle activity at the FedEx facility at the Airport. The FedEx proposal would relocate some FedEx operations from the existing facility to a new facility in order to increase operational efficiency. ANC currently has a permit and reporting requirements with ADEC. Because there is a threshold for emissions at ANC, cumulative impacts are capped at an approved ADEC rate. The Proposed Action and the FedEx facility are proposed for construction in from 2024 to 2026. Combined construction activities will increase temporary air quality impacts. However, both projects would be regulated using BMPs and will require compliance with the Alaska Pollutant Discharge Elimination System Construction General Permit. Therefore, cumulative impacts will be temporary, mitigated through BMPs, and not exceed regulatory levels of NAAQS emissions as required by the ANC air quality permit.

It is reasonably foreseeable that a reduction on fossil fuel consumption and increased reliance on alternative fuels or electric sources of energy will be adopted in the future. The 2014 ANC Master Plan update includes a discussion on a number of measures implemented to limit energy consumption and it is reasonable to expect further declines in energy consumption. Cumulative impacts resulting from this project are negligible.

## 3.3 Biological Resources

**Regulatory Context**

Biological resources include fish, wildlife, plants and their respective habitats. The following Statutes apply to resources that may occur in the project area:

The **Bald and Golden Eagle Protection Act** protects bald and golden eagles from the unauthorized capture, purchase, or transportation of the birds, their nests, or their eggs. Any action that might disturb these species requires a permit from the U.S. Fish and Wildlife Service (USFWS), which authorizes limited, non-purposeful take of bald and golden eagles.

The **Migratory Bird Treaty Act** of 1918 protects migratory birds by prohibiting private parties (and federal agencies in certain judicial circuits) from intentionally taking, selling, or conducting other activities that would harm migratory birds, their eggs, or nests (such as removal of an active nest or nest tree), unless the Secretary of the Interior authorizes such activities under a special permit.

As defined by **Executive Order 13112, Invasive Species**, 64 Federal Register 6183, (February 8, 1999), invasive species are non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Agencies are directed not to carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species unless the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures, and mitigation to minimize risk of harm are taken.

### 3.3.1 Affected Environment

According to the Alaska Department of Fish and Game Fish Resource Monitor (accessed October 2023), there are no streams or fish habitat in the project area. According to the U.S. Fish and Wildlife Information for Planning and Consultation mapper (accessed October 2023) no threatened or endangered species, or critical habitat, occurs in the project area. The project area is not in a marine environment and as such, no marine mammals occur in the project area.

The project area largely consists of sphagnum mosses, sedges, and shrubs. The area is open and undeveloped airport property. ANC has contracted with the U.S. Department of Agriculture (USDA) Wildlife Services (WS) for the purpose of Wildlife Hazard Management since 1996. WS has been tasked with mitigating wildlife/aviation conflicts and employs various techniques to ensure airport property is free of wildlife. In addition, the proposed action is located in an area contaminated with per- and -polyfluoroalkyl substances (PFAS). PFAS is a known toxin that can impact the health and welfare of animals or their offspring.

The project area occurs mostly within the existing ANC boundaries and runway object-free areas, which require an area devoid of obstructions, including tall vegetation such as trees. According to the Alaska Exotic Plant Information Clearinghouse online mapper, no invasive species are documented in the project area.

## 3.3.2 Environmental Consequences

**Significance Thresholds**

The FAA defines the significance threshold for impacts to biological resources as when the U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat. The FAA has not established a significance threshold for non-listed species.

### *3.3.2.1 Direct and Indirect Impacts*

**No-Action**

The ecology of the land makes it suitable habitat for nesting and migratory birds. However, the context of the land creates adverse impacts to biological resources for two reasons. One, animals are more prone to human conflict on the land than if they identified another location to nest and rest. If wildlife nest or rest on the location of the proposed action they are subject to trapping and removal by USDA WS. Secondly, the site is contaminated with PFAS which is a known toxin that can adversely impact the health and welfare of animals or their offspring. The site would continue to pose a risk to the health and safety of animals and wildlife.

The project area would remain susceptible to invasive species such as bird vetch (*Vicia cracca)*, yellow toadflax (*Linaria vulgaris*), and orange hawkweed (*Hieracium aurantiacum*), which are common on undeveloped portions of airport property.

**Proposed Action**

The proposed action would place permanent fill in approximately 22 acres of undisturbed land which is also known to be wildlife habitat. If the land did not exist, wildlife would nest and rest elsewhere and would not be subject to potentially stressful removals by WS. The undisturbed land that presently acts as habitat is contaminated with PFAS. PFAS contamination can have detrimental effects on the health of wildlife and their offspring. If the location did not provide habitat for wildlife and birds the animals would choose habitat elsewhere to the benefit of their health. Eliminating the habitat would be beneficial to wildlife such that it would reduce human/animal conflict and require animals to choose habitat elsewhere, likely a location without contamination.

The project area would be less susceptible to invasive species due to the addition of an impervious surface.

#### *3.3.2.2 Cumulative Impacts*

As ANC has developed over time, wildlife habitat has been eliminated. FedEx is currently planning a development adjacent to the Proposed Action, also on Postmark Bog with similar habitat conditions. The FedEx development would eliminate up to 21.9 acres of similar habitat. Other reasonably foreseeable ANC actions include continued development of airport property in areas that may contain suitable wildlife habitat. Future development is expected such that useable space within the airport boundary is developed for aviation purposes. It is reasonably foreseeable that wildlife habitat on ANC property is eliminated. This cumulative impact provides a benefit by reducing adverse human/wildlife conflict and encouraging wildlife to take up habitat elsewhere where the animals do not pose a risk to airport security and safety. Additionally, as wildlife takes up habitat elsewhere the potential for animals to consume contaminated materials would reduce providing a benefit to wildlife health.

## 3.4 Climate

**Regulatory Context**

The CAA administered by the EPA regulates greenhouse gas (GHG) emissions from surface transportation vehicles and stationary power generation sources.

### 3.4.1 Affected Environment

Six GHGs are regulated under the CAA. They include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), HFCs, perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$).

The project area is currently undeveloped and emits no climate change contributing GHGs. The wetland likely currently serves as a carbon sink, where the carbon GHG is stored and prevented entering the atmosphere. The project area currently holds no infrastructure, as such there are no associated climate resiliency risks.

Cloudy conditions, short summers, and moderate to cold temperatures characterize the climate of this area. The average annual precipitation ranges from about 15 to 30 inches to more than 100 inches in the highest mountains in the region. Later summer and fall are generally the rainiest months. The average annual snowfall ranges from about 80 to 400 inches or more. The average frost-free period is about 60 to 80 days. At higher elevations, freezing temperatures can occur during every month.

## 3.4.2 Environmental Consequences

**Significance Threshold**

FAA has not established significance thresholds for aviation or commercial space launch GHG emissions, nor has the FAA identified specific factors to consider in making a significance determination for GHG emissions (FAA 2023). However, GHG emissions should follow the basic procedure of considering the potential incremental change in $CO_2$ emissions that would result from the proposed action and alternative(s) compared to the no action alternative for the same timeframe, and discussing the context for interpreting and understanding the potential changes. Consistent with the National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, 88 Fed. Reg. 1196 (Interim Guidance Jan. 9, 2023), the Agency will try when reasonably possible quantify GHS emissions, compare GHS emission quantities across alternative scenarios, and place emissions in relevant context.

### *3.4.2.1 Direct and Indirect Impact*

Projected impacts of climate change for Southcentral Alaska include increased temperatures leading to milder winters, increased rain over the winter, and decreased snowpack. Precipitation is expected to increase in the form of rain, however higher temperatures would increase evapotranspiration and conditions are expected to be overall drier. The Proposed Action is expected to be resilient to the effects of climate change as the drainage infrastructure will withstand increased rain and higher temperatures in Alaska are still relatively mild.

Two regulated GHGs may be emitted at the project area, $CO_2$ (jet emissions and building energy usage ) and HFCs (refrigeration emissions). The proposed cargo improvements may result in an increase in emissions due to the refrigeration at the climate-controlled warehouse and the day-to-day operations of the warehouse (e.g. lighting and heating). The remainder of the project, including parking apron will not change the ANC fleet mix or size and will therefore not result in a net gain of $CO_2$ emissions. Overall $CO_2$ emissions from cargo jets may decrease at ANC because the jets will be provided space to park and spend less time idling waiting for a parking position to become available.

For building operation, $CO_2$ emissions were estimated based on a facility-related energy use value of six kilowatt hours (kWh) per square foot per year. The ACCS climate-controlled warehouse is proposed to be 136,000 square feet. The $CO_2$ emissions of the proposed ACCS climate-controlled warehouse were estimated based on the EPA's natural gas emissions factor of 0.0053 metric ton of $CO_2$ (based on therms per square foot per year) (EPA 2023a) and electricity emissions factor of 1067.7 metric ton of $CO_2$ from the EPA eGRid (based on kilowatt hours per square foot per year) (EPA 2023a). Based on the facility's estimated energy usage, it would produce 1,632 metric tons of $CO_2$ per year, which is equivalent to the energy use of 318 homes for one year. This is not expected to be a significant effect to climate.

GHG emissions in the form of HFCs may be emitted from the climate-controlled warehouse. An HFC free climate-controlled warehouse will be pursued, however the alternative methodology for refrigeration may not be feasible. If the climate-controlled warehouse requires the use of HFCs for refrigeration, emissions from the facility will not constitute a significant impact under NEPA. GHG emissions are often measured in $CO_2$ equivalent. HFCs have a high global warming potential meaning that they are a more potent GHG than $CO_2$. The $CO_2$ equivalent calculation (EPA 2023) shows that approximately 13.5 metric tons of HFC constitutes 25,000 metric tons of $CO_2$. FThe proposed project's climate controlled warehouse is not yet calculated due to preliminary design stages, but generally estimated to emit far less than 13.5 metric tons of HFCs, the $CO_2$ equivalent of 3,078 homes' energy use for one year.

GHG emissions due to construction will be $CO_2$ emissions from heavy machinery such as excavators, dozers, loaders, smooth drum rollers, sheep's foot roller, ski loader, rock trucks, dump trucks, blade motor grader, and potentially scrapers. The EPA's Simplified GHG Emissions Calculator was used to quantify project emissions (EPA 2022). The estimate for total diesel fuel needed for project construction is 90,420 gallons. The estimate for total motor gasoline needed for project construction is 5,327 gallons. According to the GHG Emissions Calculator the total $CO_2$ metric ton emissions from heavy machinery during project construction is 969 metric tons over a two-year period. The project's 969 metric tons of $CO_2$ emissions is equivalent to 122 homes' energy use for one year.

The Social Cost of Carbon (SC-$CO_2$), is a widely used method to convert emissions into familiar metrics to help federal agencies with regulating the negative and positive impact to society through a cost-benefit analysis (IWG 2021). The U.S. Government Interagency Working Group (IWG) publishes official estimates of the SC-$CO_2$, $CH_4$, (SC-$CH_4$), and $N_2O$ (SC-$N_2O$), collectively known as the social cost of greenhouse gases (SC-GHGs). The IWG does not publish estimates for the social cost of HFCs, so the societal costs can not be calculated for this project. In 2009, the IWG was established to incorporate the best available science to generate a consistent US dollar (USD) value for use across all federal agencies. In 2010, the IWG published *Social Costs of SC-$CO_2$,* developed from three integrated assessment models (IAMs). In short, the SC-$CO_2$ translates abstract metric tons of emissions into the familiar unit of USD allowing for a cost-benefit analysis. These values are important not just for the public or reader to understand the extent of impact, but also decision makers to weigh the cost of a proposed action. The IWG provides the SC-$CO_2$ across multiple discount rates and has published rates at five-year intervals, from 2020 to 2050. Construction of the Proposed Action is planned to begin in 2025. Therefore, 2025 SC-$CO_2$ rates were used in the analysis and determination of SC-$CO_2$ in USD.

*Table 3: 2025 SC-$CO_2$ rates at four discount rates and total equivalent USD amount based on emissions analysis*

| DISCOUNT RATE | SC-$CO_2$ PER METRIC TON | TOTAL SC-$CO_2$ (USD) |
|---|---|---|
| 5% average | $17 USD | $27,744 |
| 3% average | $56 USD | $91,392 |
| 2.5% average | $83 USD | $135,456 |
| 3%, 95th percentile | $169 USD | $275,808 |

In summary, the potential monetary damages year over year for facility operation are estimated to be between $27,744 and $275,808. The potential monetary damages for construction (969 metric tons over a two-year period) are estimated to be between $16,473 and $163,761.

#### *3.4.2.2 Cumulative Impacts*

FAA does not provide guidance for cumulative analysis for climate impacts. CEQ guidance for NEPA on the consideration of GHG emissions and Climate Change states "given that climate change is the result of the increased global accumulation of GHGs climate effects analysis is inherently cumulative in nature" (CEQ, 2023). The analysis presented above meets the intent of the CEQ guidance for cumulative analyses are  put into context of GHG quantification for emissions (see Section 3.4.2.1 for quantification and context).

## 3.5 Hazardous Materials, Solid Waste, and Pollution Prevention

**Regulatory Context**

Executive Order 12088, *Federal Compliance with Pollution Control Standards*, requires that federal agencies comply with applicable pollution control standards – chiefly those stemming from the Comprehensive Environmental Response, Compensation, and Liability Act and the Resource Conservation and Recovery Act. The ADEC Contaminated Sites Program manages cleanup and regulation of sites with contaminated soil or groundwater in Alaska under Alaska Administrative Code Section 18 Title 75.

### 3.5.1 Affected Environment

According to ADEC Contaminated Sites database (ADEC 2022a), there are three active sites, one cleanup complete with institutional controls (IC), and 10 cleanup complete sites within 1,500 feet of the proposed project (Table 4, Figure 6). A PFAS site investigation conducted in March 2020 found soils in the project area to be contaminated with PFAS compounds and petroleum hydrocarbons (Appendix B). The contamination levels exceed ADEC Method 2, Migration to Ground cleanup levels.

*Table 4: Contaminated Sites within 1,500 feet of the Proposed Project*

| HAZARD ID | SITE NAME | STATUS | CONTAMINATION TYPE |
|---|---|---|---|
| 26519 | AIA Tanks #19, 20, 21 | Active | Petroleum |
| 27137 | AIA Aircraft Rescue and Fire Fighting Bldg PFAS | Active | PFAS and Petroleum |
| 27763 | Anchorage FedEx Ship Center UST 3 | Active | Petroleum |
| 2009 | AFSC AIA Former Fuel Vault | Cleanup Complete- IC | Petroleum |
| 24719 | Village Aviation | Cleanup Complete | Petroleum |
| 23883 | AIA Tank #22 | Cleanup Complete | Petroleum |
| 24710 | AIA Tank #20 | Cleanup Complete | Petroleum |
| 24709 | AIA Tank #23 | Cleanup Complete | Petroleum |
| 24823 | AIA - Field Maintenance Bldg. | Cleanup Complete | Petroleum |

| | | | |
|---|---|---|---|
| 23174 | Federal Express ANCR Facility | Cleanup Complete | Petroleum |
| 24891 | USPS – GMF | Cleanup Complete | Petroleum |
| 24058 | International In-Flights Catering Company | Cleanup Complete | Petroleum |
| 24034 | USPS – Anchorage General Mail Facility | Cleanup Complete | Petroleum |
| 1468 | AIA Walker Pre-Flight Area | Cleanup Complete | Petroleum |

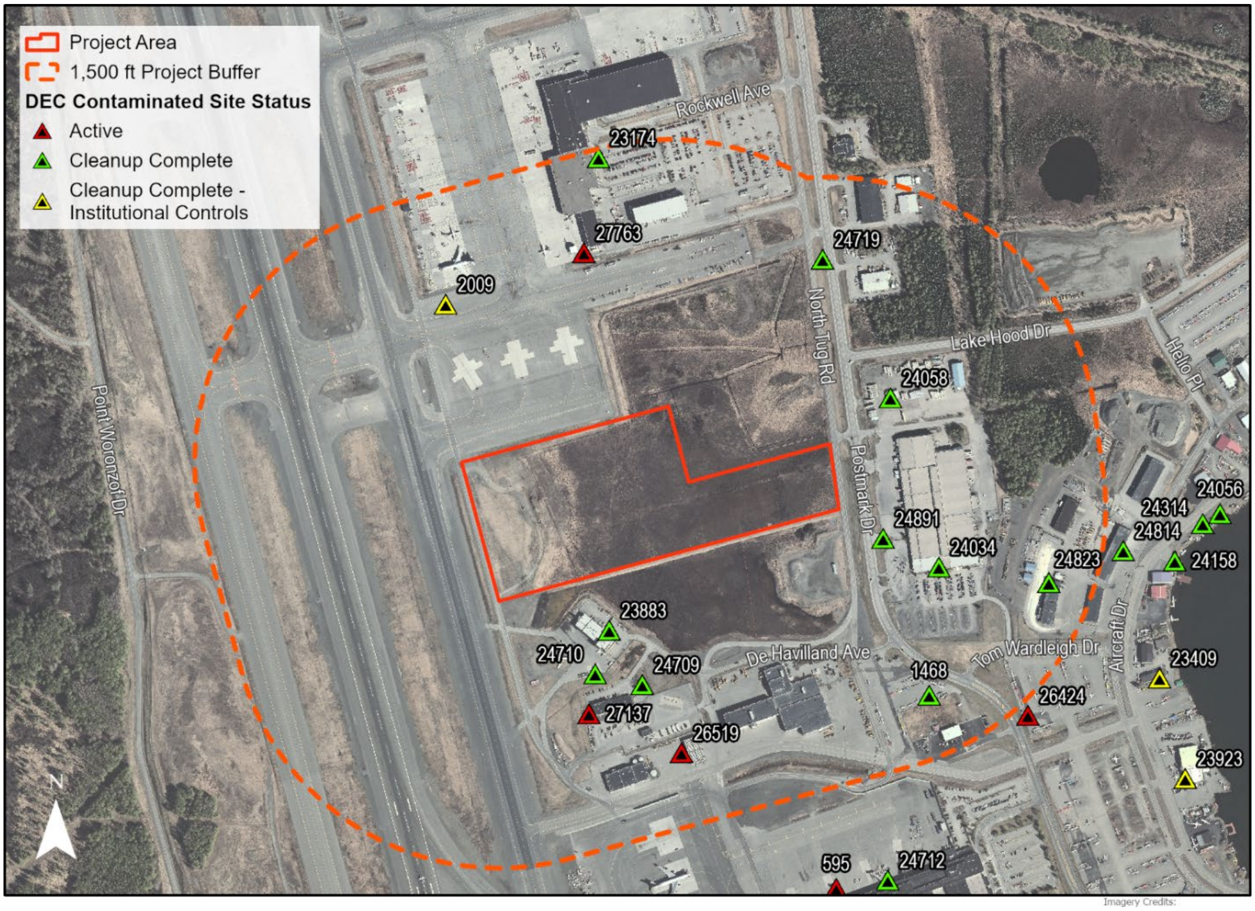


*Figure 6 Contaminated Sites in the Project Vicinity, by Hazard ID and Status*

Of the three active contaminated sites, two are leaking underground storage tanks (LUST) (Hazard IDs 26519 and 27763) leading to petroleum contamination and one site (Hazard ID 27137) is associated with aqueous film forming foam (AFFF) a known contributor to PFAS contamination.

*Hazard ID 26519: AIA Tanks #19, 20, 21*

Located over 1,000-feet from the Proposed Action, AIA Tanks #19, 20, 21 is a LUST site that was added to the ADEC Contaminated Sites Database in 2016. The site is comprised of two

15,000-gallon double-walled diesel underground storage tanks, and one 8,000-gallon double-walled gasoline underground storage tank. All three tanks had faulty retrofits which resulted in leaks of hydrocarbons. Site characterization and removal of encountered contaminated soils was conducted in 2019. Approximately five cubic yards of contaminated soil were removed and transported to another location for remediation. A request to change the status of the site to cleanup complete was denied by DEC in 2019, following the cleanup effort, due to the need for further site characterization.

*Hazard ID 27763: Anchorage FedEx Ship Center UST 3*

Anchorage FedEx Ship Center is located over 900-feet from the Proposed Action. The site was added to the ADEC Contaminated Sites Database in June 2022. The site is comprised of one 8,000-gallon LUST. No site characterization has been completed and limited sampling indicates the site is contaminated with hydrocarbon.

*Hazard ID 27137: AIA Aircraft Rescue and Fire Fighting Building PFAS*

Added to the ADEC Contaminated Sites Database in 2019, the AIA Aircraft Rescue and Fire Fighting Building PFAS site is located approximately 700-feet from the Proposed Action. The site was investigated for PFAS due to the known use of AFFF during firefighting training. Because training was conducted on or in the very near vicinity of Postmark Bog, ADEC requested a site characterization of Postmark Bog. The site characterization was conducted on to characterize proposed developments including the Proposed Action and an adjacent proposed FedEx development. The characterization indicated that Postmark Bog, as it pertains to the Proposed Action and the FedEx development is contaminated throughout with PFAS and hydrocarbons. The area has the highest levels of PFAS contamination were found along the southern edge of the Proposed Action.

### 3.5.2 Environmental Consequences

**Significance Threshold**

FAA Order 1050.1F does not define quantitative significance thresholds for hazardous materials, solid waste, and pollution. This assessment considered the following factors regarding whether the No-Action and Proposed Action would have the potential to:

- Violate applicable Federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management.
- Involve a contaminated site with unmitigated adverse effects.
- Produce an appreciably different quantity or type of hazardous waste.
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity.
- Adversely affect human health and the environment.

#### *3.5.2.1 Direct and Indirect Impacts*

**No-Action**

The No-Action alternative would have no effect on hazardous materials, solid waste, or pollution because there would be no work performed that would generate waste or other pollutants, and no potentially contaminated soil would be disturbed. The existing PFAS contaminated soils would remain in place and PFAS compounds may continue to percolate through the soils due to rain saturation. The hydrocarbon contamination in the area may degrade over time through natural attenuation.

**Proposed Action**

As discussed above, Hazard IDs 26519 and 27763 are active contaminated sites resulting from LUSTs. Each site is over 700-feet away from the Proposed Action and there is no reporting to indicate that the LUST contamination is wide-spread. Construction and operation of the Proposed Action is not expected to involve either of the two sites.

The Proposed Action is located in an area of documented soil contamination associated with Hazard ID 27137. As described above, the area is contaminated with hydrocarbons and PFAS compounds, the highest levels of PFAS contamination occurring along the southern boundary of the Proposed Action. To construct the Proposed Action, the bog will require surcharging (placing fill on top of the land to compress the soils and sediments) to create the structural integrity for the proposed facilities. As the surcharging occurs, the contaminated bog water is expected to seep out. The surcharging will occur from one project direction to another (e.g., north to south) so that the contaminated water seeps out of the land in a uniform and predictable way. The fill will be amended with PFAS treatment. The water will be captured where it seeps out and filtered through a granular activated carbon filter which has been shown to effectively remove longer chains of PFAS, such as PFOA and PFOS, from water (EPA 2018). Additional technologies are being developed at a rapid pace and the final technology chosen to cleanup expelled water will be coordinated with ADEC. The PFAS contaminated soils will remain in place and capped with an impervious surface which will minimize the PFAS compounds percolating to groundwater through saturation by rain. Coordination with ADEC is ongoing and a final remediation plan will be approved by ADEC prior to construction (see Appendix G for coordination). The contaminated site will not be disturbed without mitigation in place for adverse impacts. Mitigation will follow guidance and regulation that exists, both state and federal, and will be approved by state authority. As such, no adverse effects to human health or the environment are expected; conversely cleaning up PFAS contaminated water would provide and environmental benefit. An Interim NEPA Contaminated Materials Management Plan with proposed details for mitigation is located in Appendix B, as well as record of consultation with ADEC.

Due to the largely undeveloped nature of the project area, the Proposed Action would generate minimal construction waste. Hazardous materials used during construction would be limited to minor amounts of fuel, lubricants, hydraulic fluids, cleaning solvents, and paint. Any construction waste generated would be disposed of at the local landfill in accordance with state and federal laws and regulations. Waste, hazardous or solid, will not be an appreciably different type or quantity than that which exists currently at other aviation facilities; fuel, lubricants, hydraulic fluids, cleaning solvents, and paints are commonly used for vehicle and aviation maintenance, which is ubiquitous throughout the airport. Solid waste will be minimal because the site does not require mass excavation or demolition. Stormwater discharges during construction would adhere to a Storm Water Pollution Prevention Plan (SWPPP) required under a Construction General Permit. Stormwater during facility operations will drain into the ANC stormwater system.

Over time, the Proposed Action may result in incidental and minor releases of hazardous materials within the project area. Depending on the quantity of hazardous materials, a spill prevention, control, and countermeasure plan may be required and implemented per 40 CFR 112 and ADEC spill prevention and response regulations outlined in 18 Alaska Administrative Code 75. In addition, the project will be required to comply with the hazardous materials, storage, and spill directives of the ANC Lease (ADA 32351), ANC Operations Manual, and all applicable airport regulations.

One of the primary activities that contribute to water pollution at airports around the country is the use of glycol-based aircraft deicing fluids. Glycol mixed in a stormwater discharge has the potential to migrate to receiving waters and reduce available oxygen to aquatic life. The glycol use at ANC will not change as a result of the project because the project is not increasing the fleet size or mix at ANC. Stormwater discharges at ANC are regulated and authorized under and Alaska Pollutant Discharge Elimination System General Permit (AKR061000, expires 10/31/2024). Industrial facilities are required to be co-permittees, develop a SWPPP and adhere to the stipulations of the ANC General Permit during operations.

#### *3.5.2.2 Cumulative Impacts*

Any releases of hazardous materials over time are expected to be remediated by primary, secondary, and tertiary spill response mechanisms, and stormwater collection facilities in the event that stormwater becomes contaminated. The mechanisms include:

- Primary containment: Mobile fluid spill kits stocked with absorbent socks, pads, pillows, and loose absorbents to prevent fuel from entering storm drains.
- Secondary containment: Oil/water separator in storm water system prevents any fuel that enters the storm water system from exiting.
- Tertiary containment: Closure of valves connecting storm water system to systems off-property contains spilled fuel on the property.

Due to the spill response mechanisms, the proposed project it not expected to add additional hazardous substances and will clean up PFAS contaminated water on-site as it is expelled from the ground during surcharging. FedEx is currently planning a development adjacent to the Proposed Action, also on PFAS contaminated land. FedEx has in place an ADEC approved plan for remediation of the contamination, leading to an overall decrease in abundance of PFAS. Long term, the proposed project and the FedEx development will decrease overall contamination abundance at ANC and ensure contaminated materials do not migrate off site. Details regarding remediation of PFAS can be found in Appendix B. Annual water quality monitoring is currently conducted and would continue to be done in accordance with the APDES permit issued to ANC and would continue to occur beyond construction of the Proposed Action. Groundwater sampling in the Postmark Bog is conducted annually by DOT&PF. The number of samples and frequency of sampling may increase as more information is gathered about the extent of contamination within the area. The samples are analyzed for PFAS compounds and petroleum hydrocarbons. ADEC is notified if any samples exceed maximum contaminant levels for the targeted analytes. Samples are also collected by DOT&PF from the stormwater system to monitor for potential contamination. Details regarding the treatment plan can be found in Appendix B. ANC manages airport-wide PFAS and is responsible for coordinating with ADEC on long term monitoring and management.

# 3.6 Historical and Cultural Resources

**Regulatory Context**

Historic properties are afforded special consideration by Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). Historic properties are cultural resources that are listed on, or determined eligible for, inclusion on the National Register of Historic Places. Historic properties may include archaeological artifacts or features, and historic standing structures more than 45 years old.

## 3.6.1 Affected Environment

The area of potential effects (APE) is that area within which direct and indirect effects may occur to archaeological, historical, or other cultural resources as a result of proposed project activities. The combined direct and indirect APE consists of the 29-acre proposed project area. There are no standing structures within the APE. Ground cover consists of wetland marsh and areas of pooling water. Numerous buried utility lines cross the lease area and evidence of past ground disturbance can be seen in the western portion of the parcel.

The affected environment was identified through a desktop records review of sources of archaeological, historic, and ethnographic cultural resource data including the Alaska Historic Resources Survey, a database maintained by Alaska Department of Natural Resources, Office of History and Archaeology. In addition, DOWL incorporated a review of historic aerial imagery and remotely-sensed data to assess the degree of previous development activities and disturbance and to identify high-potential landforms for archaeological properties. The inventory included agency and consulting party outreach, archival and database research, and reviews of previous literature and reports concerning the history of ANC and FAA's presence in Alaska and Anchorage. No previously documented historic resources or areas of high potential to contain historic resources were identified in the project area.

DOWL completed a pedestrian archaeological and historic resources survey across the entire APE on June 20, 2022. The parcel is water-saturated and has been disturbed in several locations and has been used by ANC for multiple decades and was therefore considered low potential for containing intact archaeological or historic resources. No historic resources were identified in the APE as a result of the survey.

## 3.6.2 Environmental Consequences

**Significance Thresholds**

The FAA has not established significance a threshold for Historical, Architectural, Archaeological, and Cultural Resources. Factors to consider when making significance determination include a finding of *Adverse Effect* through the Section 106 process.

### *3.6.2.1 Direct and Indirect Impacts*

**No-Action**

Under the No-Action alternative, none of the proposed project components would be constructed and no ground disturbing activities would occur. Although there are no documented cultural resources in the project area, under the No-Action alternative there is no chance of disturbing an undocumented cultural resource.

**Proposed Action**

The APE consists of those areas within the proposed construction disturbance footprint. The Proposed Action is unlikely to impact any significant historical, architectural, archaeological, or cultural resources. No such resources have been documented within or adjacent to the APE. Portions of the project area are previously disturbed. Moreover, the project area does not exhibit features such as lookout points, fish streams, or good tool stone that would increase the likelihood of encountering buried archaeological resources. The APE, therefore, has low probability for undiscovered cultural resources.

A Findings Letter was sent to the State Historic Preservation Office (SHPO) on July 19, 2022, requesting a finding of *No Historic Properties Affected*. The SHPO responded with a concurrence letter agreeing to a finding of *No Historic Properties Affected* on August 5, 2022. Tribal consultation letters were sent to Chickaloon Moose Creek Native Association, Chickaloon Village Tribal Council, Cook Inlet Region Inc., Cook Inlet Tribal Council, Eklutna Inc., Knikatnu Inc., Knik Tribal Council, and Native Village of Eklutna on February 2, 2024. One response of "no comments on the tribal trust or subsistence issues…" was received from Eklutna Inc. on February 12, 2024. No other responses were received regarding tribal consultation. Appendix C shows Section 106 documentation.

#### *3.6.2.2 Cumulative Impacts*

There are no direct or indirect impacts expected from the proposed project, therefore there is not measurable accumulation of impacts and a cumulative impact analysis does not apply. FedEx is currently planning a development adjacent to the Proposed Action. A cultural resources review under Section 106 of the FedEx property also resulted in a finding of no historic properties effected.

## 3.7 Noise and Noise Compatible Land Use

**Regulatory Context**

Guidance and requirements for the assessment of aviation noise for compliance with NEPA are detailed in FAA Order 1050.1F. Per this guidance, noise exposure must be calculated using the FAA's primary noise metric for assessing the environmental impact of noise exposure, yearly Day-Night Average Sound Levels (DNL).

The compatibility of existing and planned land uses with proposed FAA actions is usually determined in relation to the level of aviation noise. Compatible use guidelines can be found in Table 1 in Appendix A of 14 CFR Part 150, *Land use Compatibility with Yearly Day-Night Average Sound Levels*. Per part 150, noise exposure levels of less than 65 DNL are considered compatible with residential and other noise-sensitive land uses. Examination of noise levels below 65 DNL is only necessary if there is substantial noise impact within the 65 DNL contour.

### 3.7.1 Affected Environment

The study area for noise consideration is the area within the DNL 65 decibel (dB) contour published in the FAA-approved *Ted Stevens Anchorage International Airport FAR Part 150 Noise Compatibility Study Update* (ANC 2015). Figure 7 shows existing noise conditions in 2009, and Figure 8 shows predicted 2020 noise contours as modeled in the 2015 study. The DNL 65 dB contour includes western half of the Proposed Action, while the eastern half of the project area is in the DNL 60 dB contour. The area is currently undeveloped and as such, no noise emissions are produced from the project area. Additionally, the existing conditions are flat, with grasses and low shrub vegetation, as such the site does not currently act to attenuate existing airport noise.

### 3.7.2 Environmental Consequences

**Significance Thresholds**

FAA Order 1050.1F establishes that noise impacts would be significant if the action would increase noise by DNL 1.5 dB or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB.

FAA Order 1050.1F, Paragraph 14.4i requires the following information be disclosed for the current condition:

- The number of people living or residences within each noise contour above DNL 65 dB, and
- The location and number of noise sensitive uses (e.g., historic sites, schools, hospitals, nursing homes, certain recreation uses, and places of worship) exposed to DNL 65 dB or greater, and
- Mitigation measures in effect or proposed and their relationship to the proposal.

Noise sensitive areas within Section 4(f) properties should receive special consideration if the value or purpose of the area can be attributed to a low noise environment. For these areas, land use compatibility may need to meet more stringent thresholds than the DNL 65 dB level and the guidelines in FAA noise regulations (14 CFR 150).

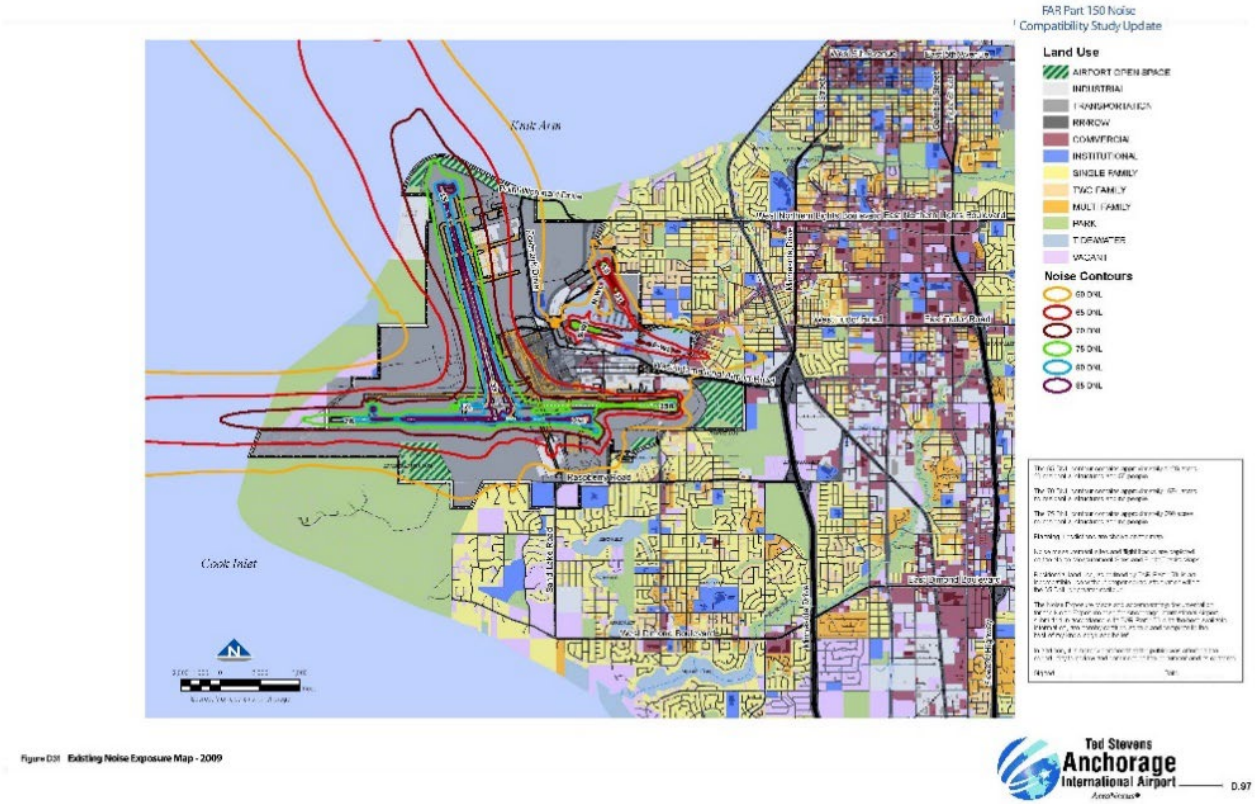


*Figure 7 ANC Existing Noise Exposure Map*

### *3.7.2.1 Direct and Indirect Impacts*

**No-Action**

Under the No-Action alternative, none of the proposed project components would be constructed, thus the noise exposure would remain consistent with present noise conditions (within the DNL 60 and 65 dB contours).

**Proposed Action**

A preliminary noise analysis determined that noise impacts from the project operations are limited to a degree that they don’t warrant a detailed analysis as described in FAA Order 1050.1F Desk Reference (please see Noise Analysis in Appendix D). The noise analysis used the Airport Equivalent Method (AEM) as a screening tool to evaluate noise impacts. AEM is a mathematical procedure that provides an estimated noise contour area of a specific airport given the types of aircraft and the number of operations (take offs or landings) for each aircraft. The tool requires input of additional landings and take offs to evaluate changes to noise

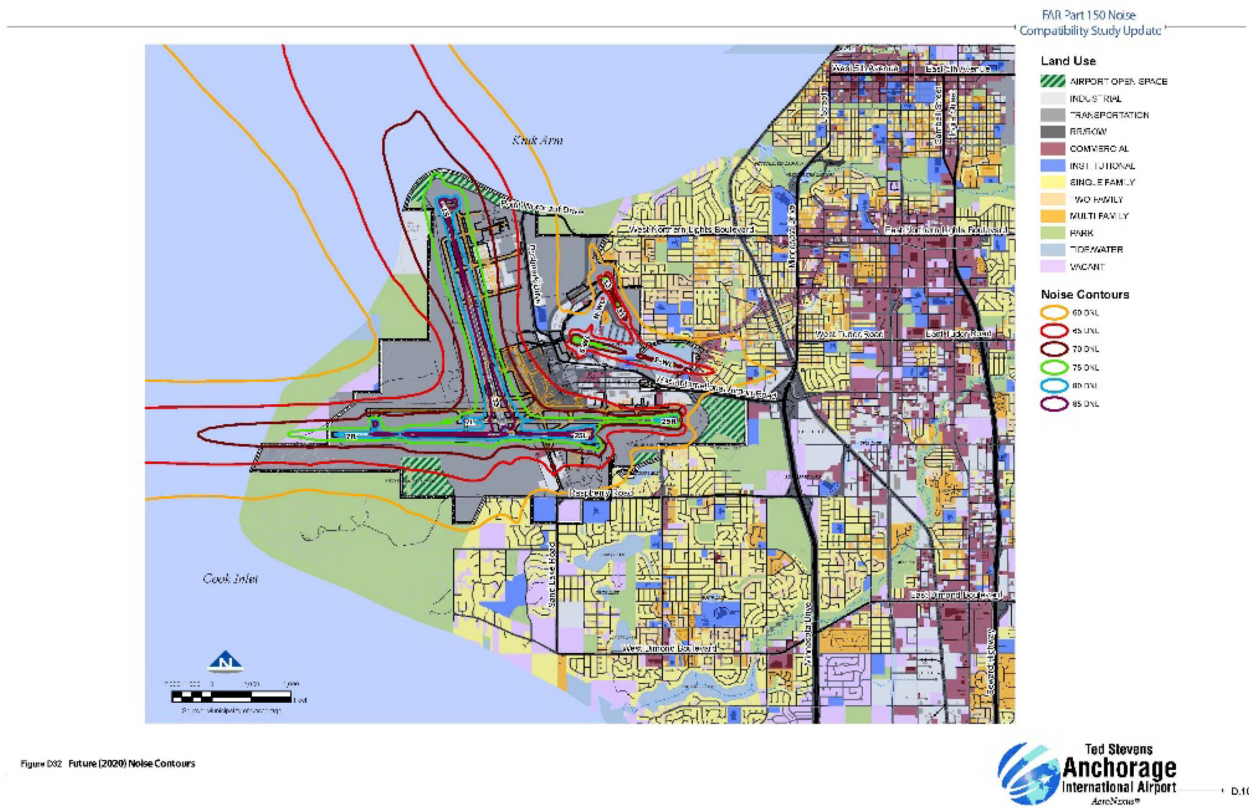


*Figure 8 ANC Predicted Noise Conditions, 2020*

contours. Although there will be no increase in airport activity due to the Proposed Action, the noise analysis used 18 additional landings and take offs as an absolute worst alternative case in order to evaluate noise impacts with the AEM tool. Eighteen additional landings and take offs (36 operations) represents an abundance of caution in evaluating noise at this location, however the screening resulted in a finding that the proposed project does not reach or exceed the production of DNL 1 dB of additional noise, as such no additional noise analysis is warranted. No significant noise impacts will occur.

Construction of the Proposed Action would result in varying levels of noise generation subject to change based on the construction intensity and distance to a given receptor. As a logarithmic unit of measurement, the decibel cannot be added or subtracted linearly. Some guidelines for understanding changes in noise levels follow.

- If two sounds of the same level are added, the sound level increases by approximately 3 dB. For example: 60 dB + 60 dB = 63 dB.
- The sum of two sounds of a different level is only slightly higher than the louder level. For example: 60 dB + 70 dB = 70.4 dB.

- Sound from a "point source," such as construction equipment, decreases approximately 6 dB for each doubling of distance.

- Although the human ear can detect a sound change as faint as 1 dB, the typical person does not perceive changes of less than approximately 3 dB.

- A 10 dB change in sound level is perceived by the average person as a doubling, or halving, of the sound's loudness.

Construction noise typically dissipates at a rate of approximately 6 dB for each doubling of distance (between the noise source and the receptor, which is the location that is representative of where the sound would be experienced (e.g., a residence)). Based on anticipated equipment that would be used during construction of the Proposed Action, the typically noisiest construction equipment with mufflers (independent of background ambient noise levels) used during excavation and grading was the basis for this analysis. These pieces of equipment may generate a noise level of approximately 88 dB at 50 feet from the noise source. Based on a sound dissipation rate of 6 dB per doubling of distance, a sound level of 88 dB at 50 feet from the noise source would be approximately 82 dB at a distance of 100 feet, 76 dB at a distance of 200 feet, and so on. That sound dissipation rate and the corresponding attenuation estimates are conservative in that they do not take into account any intervening shielding (including landscaping or trees) or barriers, such as structures or hills between the noise source and noise receptor, which would further reduce noise levels. (Federal Highway Administration, 2006).As reported in the Airport's FAR Part 150 Compatibility Study Update, a semi-permanent noise monitor was set up at 3190 Bridle Lane, which is at the approximate location of the nearest residential land use to the project study area (ANC 2015). The ambient noise at this monitoring site was recorded at 59.3 dB in the winter and at 64.9 dB in the summer. Therefore, due to the distance from the closest sensitive noise receptor, noise attenuation from the project study area, and typical ambient noise levels, construction noise would not likely be perceptible at the nearest residence to the project study area.

Project construction will abide by the Anchorage Noise Control Ordinance (AMC 15.70). Thus, and for example, work on nights, weekends, or holidays would require a Noise Permit. If the sound levels for construction triggered a requirement for a construction Noise Permit, the Municipality of Anchorage could place such conditions on the permit as deemed necessary or advisable by the Municipality, thus further addressing as appropriate the eventuality of temporary noise impacts. Abatement methods such as proper maintenance of construction equipment would help further reduce impacts.

#### *3.7.2.2 Cumulative Impacts*

There are no direct or indirect impacts expected from the proposed project, therefore there is not measurable accumulation of permanent impacts and a cumulative impact analysis does not apply. Although there is no perceptible increase in noise from the Proposed Action, it is important to disclose that FedEx is currently planning a development adjacent to the Proposed Action. Operation of the FedEx facility would not result in an increase in activity as certain operations would be moved from the existing facility to the new facility. Cumulative impacts of both the FedEx facility and the Proposed Action are negligible as demonstrated by the Proposed Action Noise Analysis (Appendix D) and the understanding that FedEx is not increasing operations. Cumulative noise impacts airport-wide are studied and disclosed in the FAR Part 150 Noise Compatibility Study (ANC 2015).

The Proposed Action and the FedEx facility are proposed for construction from 2024 to 2026, there may be overlap as the Proposed Action is expected to go to construction in 2025. Combined construction activities will increase temporary noise impacts. However, both projects are subject to the same noise ordinance requirements. Cumulatively, the consistency of noise may increase (more loud noises throughout the day), however cumulatively construction of the two projects together is not expected to increase dB output. Both projects are subject to the same inversely proportional relationship between source sound pressure and distance from the sounds source (-6 dB per doubling of distance). According to the inversely proportional relationship between source sound pressure and distance from the sounds source, the 65dB contour of construction equipment noise would be approximately 800 feet. The noise changes to 58dB at 1600 feet. No sensitive land exists within 1600 feet of either property.

## 3.8 Visual Resources / Visual Character

**Regulatory Context**

There are no federal special purpose laws or requirements specific to light emission and visual effects. Relevant special purpose laws include Section 106 of the NHPA and Section 4(f) of the USDOT Act; both laws require consideration of visual impacts to protected resources.

### 3.8.1 Affected Environment

Baseline conditions for visual resources and visual character near the Proposed Action include airport infrastructure and governmental buildings. To the north of the proposed project is hardstands and Taxiway Papa. To the west is Taxiway Romeo and the main north/south runway. To the east is Postmark Drive and the US Postal Service Post Office. Lastly to the south of the project area are government or airport related buildings such as Field Maintenance Facility, Airport Police and Fire, and Anchorage Fueling and Service Company. The character of the surrounding area is generally a built environment of aviation support infrastructure and facilities.

### 3.8.2 Environmental Consequences

**Significance Thresholds**

The FAA has not established a significance threshold for light emissions or visual resources / character. Factors to consider include the extent to which the action would have the potential to:

- Create annoyance or interfere with normal activities from light emissions
- Affect the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources
- Contrast with the visual resources and/or visual character in the study area
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations

#### *3.8.2.1 Direct and Indirect Impacts*

The Proposed Action is not expected to have light impacts that substantially alter the character of the area; the proposed project area is on airport property adjacent to existing aviation facilities with security lighting. The climate-controlled warehouse would be up to 75 feet tall. Turnagain is the nearest neighborhood to the proposed facilities, approximately 0.85 miles away. The proposed facilities will not be visible to the neighborhood due to distance, vegetative buffers, and the existing infrastructure between the neighborhood and the proposed facilities. Earthquake Park is the nearest recreational resource to the proposed project, approximately 0.85 miles away. Earthquake Park and associated trails are vegetated, obscuring views of the airport and subsequently obscuring views of the proposed facilities.

Light emissions already exist in the area and the addition of the Proposed Action is not expected to interfere with normal activities. The proposed project is consistent with the land uses in the surrounding area and will not be visible from the nearest residential area, nor the nearest recreational area.

#### *3.8.2.2 Cumulative Impacts*

The cumulative impact of the proposed project is not expected to be significant because it is consistent with the existing visual character of airport property. Airport property in the area has existing aviation facilities, runways, taxiways, and terminals. FedEx is currently planning a development adjacent to the Proposed Action. The visible portions of the proposed FedEx consist of two buildings, vehicle parking, aircraft apron, a new connection to Postmark Drive, and a perimeter fence; all in support of air cargo activities. The Proposed Action and the proposed FedEx facility are consistent with the current visual resources in the surrounding area and will not create a significant interference with normal activities.

## 3.9 Water Resources

<u>Floodplains</u>

Floodplains in the area are shown on Federal Emergency Management Agency Flood Insurance Rate Map 0200050740D (effective 9/25/2009). The project area is in a Zone X, defined as an area of minimal flood hazard. The project is not expected to have any floodplain impacts.

<u>Wild and Scenic Rivers</u>

The National Park Service's National Wild and Scenic Rivers System (WSRS) list and Nationwide Rivers Inventory (NRI) indicates there are no designated units of the WSRS or NRI-designated waters in the project area or vicinity.

Surface Water and Groundwater – According to FAA Order 1050.1F Desk Reference (FAA 2023), surface waters include streams, lakes, rivers, lakes, ponds, estuaries, and oceans. A review of the U.S. Geological Survey National Hydrography Dataset shows there are no waterways or waterbodies within the project area.

Although no waterways or waterbodies occur in the project area construction and operation of the Proposed Action would have the potential for water quality issues such as increased surface runoff. However, as identified in the CMMP prepared for the Proposed Action (Appendix B), soil handling during construction would be conducted in a manner that prevents the release of contaminants to surface water and is protective of the water quality standards presented in the ADEC's 18 AAC 70 Water Quality Standards regulations. Storm water management procedures would be outlined in the project SWPPP and ESCP prepared by the Contractor. Groundwater generated during construction would be managed in accordance with the terms and conditions of the ADEC Excavation Dewatering Permit, AKG002000. A dewatering and best practices plan would be prepared by the Contractor and submitted to ADEC for approval prior to the start of dewatering. The plan would include details of the treatment system design and processes.

Storm water runoff resulting from the addition of an impervious surface would flow into a culvert under North Tug Road which connects to a storm drainpipe that discharges directly into Knik Arm. The discharge of stormwater from airport property is regulated under Clean Water Act Section 402 through an Alaska Pollutant Discharge Elimination System permit.

According to the Environmental Protection Agency's Sole Source Aquifer web-mapper (accessed October 2023), no sole source aquifers exist in Alaska. Groundwater in the Postmark Bog area has been measured at around 100 feet below ground surface (ADEC 2022b). Limited excavation for utility installations may be between zero and 25 feet below ground and is not expected to reach 100 feet below ground surface – the depth of groundwater, as such no impacts to groundwater are expected.

<u>Wetlands</u>

**Regulatory Context**

The Clean Water Act (CWA) establishes the basic structure for regulating the discharge of pollutants into waters of the United States, which includes wetlands. Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States. Section 401 of the CWA ensures that federal actions do not impair water quality.

Executive Order 11990 directs all federal agencies to avoid adverse impacts associated with the destruction or modification of wetlands, to the extent practicable. The stated purpose of this Executive Order is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands."

### 3.9.1 Affected Environment

The MOA classifies about 22 acres within the 29-acre proposed project area as a Class A wetland (Figure 9) and specifies the area as Site #26D in its Wetlands Management Plan (MOA 2014). A 2019 Wetland Delineation and functional assessment report by the DOT&PF (DOT&PF 2019) confirmed the presence and extent of the wetland as mapped by MOA and the USFWS National Wetlands Inventory (USFWS 2022). Most of the area consists of Freshwater Emergent Wetland, with some Freshwater Forested/Shrub Wetland on the north and west edges. The MOA Wetlands Management Plan indicates that the site is significant due to nesting and migratory bird habitat, stormwater treatment and attenuation values.

An Approved Jurisdictional Determination was requested from the U.S. Army Corps of Engineers (USACE) to determine if wetlands mapped within the study area are navigable waters, interstate waters, part of a tributary system, adjacent wetlands, or impoundments, and therefore subject to Section 404 of the CWA. An Approved Jurisdictional Determination (AJD) obtained in June 2021 found that there are adjacent wetlands ((a)(4) waters) under CWA jurisdiction within the project area (Appendix E). According to the AJD, a direct hydrologic surface connection between wetland #26D and Knik Arm is maintained through artificial features, including a culvert under North Tug Road which connects to a storm drainpipe that discharges directly into Knik Arm.


*Figure 9 Wetlands in the Project Area*

### 3.9.2 Environmental Consequences

#### Significance Thresholds

FAA Order 1050.1F determines significance based on whether the Proposed Action would:

- Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers.
- Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected.
- Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety, or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public).
- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands.
- Promote development of secondary activities or services that would cause the circumstances listed above to occur.

- Be consistent with applicable state wetland strategies.

##### *3.9.2.1 Direct and Indirect Impacts*

**No Action**

The No-Action alternative would not require modification to, or placement of fill within wetlands, as no construction would take place.

**Proposed Action**

The Proposed Action would fill and result in unavoidable permanent impacts to about 22 acres of wetlands. According to the Anchorage Wetlands Management Plan (AWMP)(MOA 2014), the wetland is a part of site number 26D, “Postmark Drive West”. According to the AWMP functions lost by the permanent impacts include groundwater recharge, water quality, stormwater attenuation, aesthetic and noise buffer, and migratory and nesting bird habitat. Although the wetland provides good habitat for migratory and nesting birds, U.S. Department of Agriculture has a contract with ANC for wildlife hazard mitigation, including the Postmark Bog location. Nesting and migratory birds are regularly removed from airport property, including Postmark Bog due to the inherent hazard to aviation. The wetland’s significant function as wildlife habitat is diminished by the hazard mitigation program.

The primary function of the Postmark Bog wetland is stormwater runoff attenuation from airport impervious surfaces. Complete avoidance of impacts to wetlands is not possible to meet the project’s purpose and need. The size of the facility is necessary to help meet the demand for various storage types (cold, heated, and general) as well as equipment and aircraft staging and storage. The footprint of the pad has been minimized by decreasing the pad and driveway side slopes. In addition, by placing the building on piles, the amount of fill placed has been minimized. A USACE Individual Permit was approved on June 30, 2023 (Appendix E). The permit includes special conditions for wetland mitigation credits to be purchased prior to construction to compensate for the loss of functions of Postmark Bog. A total of 23.965 credits must be acquired to offset the loss of acreage and functions due to the Proposed Action. Table 5 summarizes the wetland impacts expected to occur as a result of this project.

The proposed project would result in impacts that meet or exceed the significance thresholds stated above. However, the USACE as the regulatory agency dictates mitigation requirements such that impacts will be offset by the appropriate amount of compensatory mitigation. The credits for mitigation to offset wetland impacts were determined at a ratio of 1.75 to 1. Compensatory mitigation as determined by the USACE will be applied to bring the overall level of impact to wetlands below significant. USACE evaluated impacts to wetlands in their environmental document, called a Statement of Findings, found in Appendix F.

*Table 5: ACCS Facility Permanent Wetland Impacts*

| PROJECT COMPONENT | AREA (ACRES) | VOLUME (CY) |
|---|---|---|
| Aircraft Apron | 13.8 | 422,238 Total |
| Heavy Duty Concrete | | 33,334 |
| MOA Type II | | 44,446 |
| MOA Type III | | 277,789 |
| Surcharge | | 66,669 |
| Building | 3.2 | 96,096 Total |
| MOA Type II | | 10,445 |
| MOA Type III | | 69,983 |
| Surcharge | | 15,668 |
| Parking Area | 1.0 | 28,822 Total |
| Asphalt | | 554 |
| Base Course | | 586 |
| MOA Type II | | 3,257 |
| MOA Type III | | 19,540 |
| Surcharge (MOA Type III) | | 4,885 |
| Drive Aisles | 3.6 | 105,866 Total |
| Asphalt | | 2,000 |
| Base Course | | 2,117 |
| MOA Type II | | 11,763 |
| MOA Type III | | 72,342 |
| Surcharge | | 17,644 |
| **Total** | **21.6** | **653,022** |

#### *3.9.2.2 Cumulative Impacts*

According to the Anchorage Wetlands Management Plan (2014), Postmark Bog has lost approximately 27 acres of wetlands since 1996. The proposed action would fill an additional 21.6 acres of wetlands. Reasonably foreseeable actions include the adjacent FedEx development, also located on Postmark Bog. The FedEx development proposed to fill and additional 14.32 acres of wetlands for a cumulative impact of 35.92 acres. It is reasonably foreseeable that the Postmark Bog wetlands will be filled entirely by aviation developments. The USACE requires mitigation for unavoidable impacts to jurisdictional wetlands. The amount of mitigation required has been determined by the USACE as the jurisdictional regulatory agency and will offset the loss of Postmark Bog wetlands. The total credits required by both FedEx and the Proposed Action for compensatory mitigation is 36.62 credits.

Although we are not directly relying on the USACE environmental analysis, we note that they reached a similar conclusion. Specifically, the USACE concluded that cumulative impacts were not significant in the Department of the Army Environmental Assessment and Statement of Findings associated with the Individual Permit for the Proposed Action (POA-2021-00121): "When considering the direct and indirect impacts that will result from the proposed activity, in relation to the overall direct and indirect impacts from past, present, and reasonably foreseeable future activities, the incremental contribution of the proposed activity to cumulative impacts in the area described in section 9.2, are not significant. Compensatory mitigation will be required to offset the impacts of the proposed activity to eliminate or minimize its incremental contribution to cumulative effects within the geographic area described in Section 9.2. Mitigation required for the proposed activity is discussed in Section 8.0." Please see Appendix E for the Department of the Army Environmental Assessment and Statement of Findings.

# 4.0 ENVIRONMENTAL COMMITMENTS

The Proposed Action will adhere to all federal, state, and local laws. In addition, construction of the Proposed Action will include measures to avoid, minimize, and mitigate potential environmental impacts through standard operating procedures and best management practices. Table 6 shows proposed environmental commitments that arose from coordination with regulatory agencies. In addition to the environmental commitments the proposed project will adhere to all permit stipulations that may arise during the permitting process.

*Table 6: Environmental Commitments*

| TOPIC | COMMITMENT |
|---|---|
| Hazardous Materials | • If excess soils are generated that require treatment or disposal, coordination with ADEC will be required prior to treatment of disposal.<br>• Dewatering will require a DEC approved treatment plan (approved CMMP) prior to dewatering activities. |
| Wetlands | Compensatory mitigation will be provided for unavoidable impacts to jurisdictional wetlands. |

# 5.0 PUBLIC AND AGENCY INVOLVEMENT

**Regulatory Context**

The intent of public involvement is to inform the public and solicit comments. CEQ defines the requirements for public involvement in NEPA under 40 CFR § 1506.6. In summary, under CEQ guidelines agencies shall make diligent efforts to involve the public. Additionally, FAA requirements for public involvement while completing an EA are discussed in FAA Order 1050.1F. Paragraph 6-2.2(b) of the Order states that the FAA or applicant must involve the public, to the extent practicable, in preparing EAs. Under FAA Order 1050.1F, public involvement is determined on a case-by-case basis, and scoping (a method for soliciting comments) is optional.

Agency involvement for EAs is discussed in paragraph 6-2.2(d) and recommends contacting appropriate entities to obtain information concerning potential environmental impacts.

## 5.1 Public Involvement

Alaska Cargo and Cold Storage began public outreach in May 2022 to inform the public about proposed developments to the Alaska Cargo and Cold Storage site. Public involvement included publishing the Notice of Intent to Prepare an Environmental Assessment in the Anchorage Daily News, which opened a comment period from May 29th to July 1st 2022. An additional public comment period to solicit feedback on the Draft EA was opened September 4, 2023 and closed October 15, 2023. A public meeting was held on October 3, 2023. Notification of the Draft EA availability and the scheduled public meeting was provided as follows:

- Legal ad in the Anchorage Daily News
- Notification on the State of Alaska Online Public Notification System
- Notification through the State of Alaska GovDelivery
- Postcards sent to businesses within one mile (approximately 100)
- Email to the Federation of Community Councils

Public Involvement materials can be found in Appendix F.

One public comment was received during the initial scoping and discussed a primary concern of pollutants and hazardous materials spills as they relate to impacts to humans and biological resources. One formal comment was received at the October 3, 2023 public meeting and discussed a recommendation for in-ground power for jets so that they can turn off the auxiliary power units while parked. General discussion topics at the public meeting included ANC-wide cumulative impacts including noise and air quality, concerns of additional traffic on West Northern Lights Boulevard, general interest in the Section 404 CWA permit and mitigation, and discussion on contamination and remediation techniques. A comment response log can be found in Appendix F.

Additional public involvement that should be considered is the outreach associated with the ANC Master Plan update (Ted Stevens Anchorage International Airport, 2014). The public involvement process for the ANC Master Plan update is the preliminary outreach to solicit comments on what should go where on airport property. The substantial public outreach efforts were conducted over 18 months from 2012 to 2014. The ALP was approved in 2014, including the proposed location being designated for cargo facilities.

## 5.2 Agency Involvement

Agency scoping was conducted with agencies that may have jurisdictional resources within or near the project area. Scoping materials including a background letter and a preliminary environmental research report were sent to agencies on June 10, 2022 (Appendix G). Agencies were sent a Notice of Availability of the Draft EA and Notice of a Public Meeting on September 12, 2023.

Agency comments during scoping were specific to wetlands and contamination. ADEC stated that a plan for construction dewatering would be required prior to construction. The proposed plan, as described in Section 3.5.2, is in development with ADEC and will require approval prior to ground disturbing activities. The MOA Planning Department requested clarification of a sentence in the scoping documents as it related to contaminated water cleanup. A response was sent to provide a summary of the methodology expected for contaminated water cleanup, no further requests were received. No agency comments were received on the Draft EA.

*Table 7: Agency Responses to Scoping*

| AGENCY | SUMMARY RESPONSE TO SCOPING |
|---|---|
| Alaska Department of Environmental Conservation, Contaminated Sites Program | Contamination is known to exist on-site. Restrictions on use or disposal will be in place. A plan will be required for dewatering or disposal of soils. |
| Alaska Department of Environmental Conservation, Drinking Water Program | No concern, project is not near an active public water system. |
| Alaska Department of Environmental Conservation, Solid Waste Program | No concern, no solid waste sites exist at the project location. |
| Alaska Department of Natural Resources, State Historic Preservation Office | No concern, no historic properties are in the immediate vicinity. |
| Environmental Protection Agency | Recommends consideration of climate change, and avoidance, minimization, and mitigation for impacts to wetlands. |
| Municipality of Anchorage, Planning Department | Request for information on how contaminated water will be treated and how coordination with ADEC will occur |

# 6.0 LIST OF PREPARERS

| NAME | POSITION AND AFFILIATION | ROLE |
|---|---|---|
| Theresa Dutchuk | DOWL | Main Author |
| Donna Robinson | DOWL | Support Author |
| Emily Corley | DOWL | Support Author |
| Gretchen Dana | DOWL | Support Author |
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| Gina Stevens | DOWL | Document Format |
| Joe Jacobson | McKinley Capital | EA Review |
| Matt VanGoethem | MCG Explore Design | EA Review |
| Jason Gamache | MCG Explore Design | EA Review |
| Tenor Engineering Group | - | Noise Analysis |

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# APPENDIX A:

# SECTION 163 DETERMINATION

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
222 W. 7th Avenue, Box #14
Anchorage, AK 99513-7587
Telephone: 907-271-5438
Fax: 907-271-2851

May 3, 2022

Teri Lindseth
Deputy Director, Planning and Development
Ted Stevens Anchorage International Airport
P.O. Box 196960
Anchorage AK, 99519

Dear Teri:

Thank you for your inquiry regarding whether or not the FAA has a federal action on the proposed Alaska Cargo and Cold Storage Development project to be located on airport property at Ted Stevens Anchorage International Airport (ANC). On April 27, 2022, your office submitted a revised scope of development. As such, this letter supersedes FAA's original determination letter dated May 6, 2021, to account for the new scope.

Recent changes in federal law have required the Federal Aviation Administration (FAA) to revisit whether FAA approval is needed for certain types of airport projects throughout the nation. On October 5, 2018, HR 302, the "FAA Reauthorization Act of 2018" (the Act) was signed into law (P.L. 115-254). In general, Section 163(a) limits the FAA's authority to directly or indirectly regulate an airport operator's transfer or disposal of certain types of airport land. However, Section 163(b) identifies exceptions to this general rule. The FAA retains authority:

1. To ensure the safe and efficient operation of aircraft or safety of people and property on the ground related to aircraft operations;
2. To regulate land or a facility acquired or modified using federal funding;
3. To ensure an airport owner or operator receives not less than fair market value (FMV) in the context of a commercial transaction for the use, lease, encumbrance, transfer, or disposal of land, any facilities on such land, or any portion of such land or facilities;
4. To ensure that that airport owner or operator pays not more than fair market value in the context of a commercial transaction for the acquisition of land or facilities on such land;
5. To enforce any terms contained in a Surplus Property Act instrument of transfer; and,
6. To exercise any authority contained in 49 U.S.C. § 40117, dealing with Passenger Facility Charges.

In addition, Section 163(c) preserves the statutory revenue use restrictions regarding the use of revenues generated by the use, lease, encumbrance, transfer, or disposal of the land, as set forth in 49 U.S.C. §§ 47107(b) and 47133.

Section 163(d) of the Act limits the FAA's review and approval authority for Airport Layout Plans (ALPs) to those portions of ALPs or ALP revisions that:

1. Materially impact the safe and efficient operation of aircraft at, to, or from the airport;
2. Adversely affect the safety of people or property on the ground adjacent to the airport as a result of aircraft operations; or
3. Adversely affect the value of prior Federal investments to a significant extent.

In light of this statutory change, the FAA's Alaskan Region Airports Office has performed a review in order to determine if the FAA has the authority to approve or disapprove all or parts of the project.

Proposed Project

The Ted Stevens Anchorage International Airport (ANC) has submitted a proposed ALP Update, which includes the construction of the Alaska Cargo and Cold Storage development in order to accommodate existing and future demand for cargo operations, increase operational efficiencies through new and improved cargo and airline support facilities, and meet FAA and airport safety requirements.

Major components of the proposed project action are:

a. Cargo Warehouse
b. Cold Storage
c. New Aircraft Parking Apron
d. Hardstand Fuel Distribution
e. Ground Support Equipment Shop and Parking
f. Ancillary/Control Space
g. Road Connection to Postmark Dr.

The proposed project is located on the east side of the airport; east of Runway 15/33, south of Taxiway P, west of Postmark Drive, and north of the Aircraft Rescue and Fire Fighting Station. The area consists of 29 acres.

Determination Regarding the Airport Layout Plan

1. Because portions of the proposed development may have a material impact on aircraft operations, at, to, or from the airport, the FAA retains the legal authority to approve or disapprove the following changes to the ANC ALP:

a. New Aircraft Parking Apron

2. Because the remaining portions of the proposed development would have no material impact on aircraft operations at, to, or from the airport, would not affect the safety of people and property on the ground, and would not have an adverse effect on the value of prior Federal investments to a significant extent, the FAA lacks the legal authority to approve or disapprove changes to the ANC ALP for the following project components:

a. Cargo Warehouse
b. Cold Storage
c. Hardstand Fuel Distribution
d. Ground Support Equipment Shop and Parking
e. Ancillary/Control Space
f. Road Connection to Postmark Dr.

FAA's Authority to Regulate Land Use

The land subject to the proposed project was acquired through two deeds, Tract II a patent deed transferred on January 9, 1967 through the Federal Airport Act instrument of transfer and Tract IV a patent deed transferred on August 30, 1961 through the Alaska Statehood Act.

Because the land associated with this project within Tract II was acquired with federal funds, under Section 163(b) of the Act, the FAA has the legal authority to approve or disapprove the use of the land associated with this project. The proposed development is consistent with the intended use of the land. Therefore, the FAA will not require a release of obligations in order to maintain the use of the subject parcel as depicted on the currently approved ALP.

The land associated with this project located within Tract IV was not acquired with federal funds, therefore, under Section 163(b) of the Act, FAA does not have the legal authority to approve or disapprove the use of the land associated with this project.

Applicability of the National Environmental Policy Act (NEPA)

The FAA's ALP approval authority for portions of the proposed project, and any other Federal approvals associated with the project, such as funding under the AIP or PFC programs, is a federal action subject to the National Environmental Policy Act (NEPA). Therefore, the sponsor will be required to perform an appropriate environmental review consistent with NEPA.

Sponsor Obligations Still In Effect

This determination only addresses FAA's approval authority for this project. It is not a determination that the project complies with the sponsor's federal grant assurances. The sponsor must continue to comply with all of its Federal grant obligations, including but not limited to Grant Assurance #5, Preserving Rights and Powers; Grant Assurance #19, Operation and Maintenance; Grant Assurance #20, Hazard Removal and Mitigation; Grant Assurance #21, Compatible Land Use; and Grant Assurance #25 Airport Revenue.

Section 163 and Grant Assurance 25 require the airport sponsor to receive not less than fair market value for the use, lease, encumbrance, transfer, or disposal of land, any facilities on such land, or any portion of such land or facilities. The sponsor must ensure that all revenues generated as a result of this project may only be expended for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport.

The sponsor also has the responsibility to comply with all federal, state, and local environmental laws and regulations.

Additionally, any development on this parcel is still subject to airspace review under the requirements of 14 CFR part 77, and Grant Assurance 29 still requires the airport to update and maintain a current ALP. An updated ALP should be submitted to the FAA Alaskan Region if the project is completed.

This is a preliminary determination, and does not constitute a final agency action or an "order issued by the Secretary of Transportation" under 49 U.S.C. § 46110.

If you have further questions or need for clarification, please feel free to contact me at 907-271- 5040, or via email at jonathan.linquist@faa.gov.

Sincerely,

**JONATHAN LINQUIST**

Digitally signed by JONATHAN LINQUIST Date: 2022.05.03 06:34:53 -08'00'

Jonathan Linquist
Lead Planner
Alaskan Region Airports Division

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# APPENDIX B:

# HAZARDOUS MATERIALS AND CONTAMINATION REPORTS

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# TED STEVENS ANCHORAGE INTERNATIONAL AIRPORT PFAS SITE INVESTIGATION

## Postmark Bog Development Area

ADEC File Number: TBD
ADEC Hazard Identification Number: TBD


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September 21, 2020

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ADEC | Alaska Department of Environmental Conservation |
| ADOT&PF | Alaska Department of Transportation & Public Facilities |
| ANC | Ted Stevens Anchorage International Airport |
| AOA | Airport Operations Area |
| bgs | below ground surface |
| ° C | degrees Celsius |
| COC | chain of custody |
| COPC | Contaminant of Potential Concern |
| CRW | CRW Engineering Group, LLC |
| DRO | Diesel Range Organics |
| EPA | Environmental Protection Agency |
| GRO | Gasoline Range Organics |
| HDPE | high density polyethylene |
| mg/Kg | milligram per kilogram |
| MTG | Migration to Groundwater |
| PFAS | Per- and Polyfluoroalkyl Substances |
| PFOA | Perfluorooctanoic acid |
| PFOS | Perfluorooctanesulfonic acid |
| PID | Photo Ionization Detector |
| PPMV | Parts Per Million by Volume |
| QEP | Qualified Environmental Professional |
| QES | Qualified Environmental Sampler |
| RRO | Residual Range Organics |
| RSE | Restoration Science & Engineering, LLC |
| SGS | SGS North America Inc. |
| TOC | Total Organic Carbon |

# 1.0 INTRODUCTION

## 1.1 Objectives

On behalf of the Alaska Department of Transportation & Public Facilities (ADOT&PF) and CRW Engineering Group, LLC (CRW), Restoration Science & Engineering, LLC (RSE) prepared the following subsurface Per- and Polyfluoroalkyl Substances (PFAS) site investigation report at the Postmark Bog Development area (Figures 1). The objectives of this investigation were to determine whether PFAS related compounds are present in soil within the peat-rich subsurface soil at the project area. This investigation was intended to inform Ted Stevens Anchorage International Airport (ANC) engineers and managers of PFAS contamination which may impact future development at the Postmark Bog. Data from this investigation are usable for the intended purpose of comparison to Alaska Department of Environmental Conservation (ADEC) Method 2 Migration to Groundwater (MTG) and Human Health cleanup levels to support Postmark Bog Development decision making.

## 1.2 Site History

Between March 3 and March 5, 2020, RSE collected PFAS soil samples from 43 shallow (< 12 inches) hand dug test holes at the Postmark Bog (RSE 2020A). The soil sample locations were marked by CRW prior to RSE commencing field work. RSE Qualified Environmental Professional (QEP), Kyle Wiseman and RSE Qualified Environmental Sampler (QES), Marc Boas, collected each sample for PFAS compounds in soil, including Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS).

PFAS compounds were detected in all 43 soil samples. Except for soil samples T1-01 and T1-24 all soil samples exceeded ADEC Method 2 MTG cleanup levels for PFOA and/or PFOS. Detectable concentration of PFOA ranged from 0.0017 mg/Kg (at T2-03) to 0.132 mg/Kg (at T1-40). Detectable concentrations of PFOS ranged from 0.00070 mg/Kg (at T1-01) to 35.9 mg/Kg (at T1-40).

The soil samples collected during the March 2020 investigation were collected from ice-rich or wet peat. In some test pits, water was encountered at 10 to 12 inches bgs. The percent solids among the 43 soil samples ranged from 5.4% to 88.1%. Thirty-two soil samples had percent solids < 20%.

## 1.3 Project Location

The Postmark Bog Development area is shown on Figure 1 (Appendix A). The project area is located outside the Airport Operations Area (AOA) near the ANC Fire Station. The project area is accessed from Postmark Road.

Using Google Earth, RSE determined the project area is generally located at (WGS 84):

Latitude 61° 11' 06.61" N
Longitude 149° 59' 36.3" W

# 2.0 FIELD WORK

## 2.1 Field Work Narrative

On August 6—7 and August 10—11, 2020, RSE collected soil samples from 19 soil boring locations within the Postmark Bog Development area. The ADEC approved work plan suggested 22 soil boring locations. However, soil borings T1-01, T1-09 and T1-25 consisted of mineral soil and were not sampled. RSE QEPs Lisa Koeneman and Kyle Wiseman collected each sample for PFAS compounds in soil in general accordance with the ADEC approved work plan (RSE 2020B). RSE collected two composite samples for PFAS compounds at all soil boring locations except T1-15 and T2-03. RSE collected one composite sample for petroleum hydrocarbons from the soil interval with the highest field-screening result.

## 2.2 PFAS Soil Sampling

RSE collected two composite samples from soil borings T1-03, T1-05, T1-07, T1-11, T1-13, T1-15, T1-17, T1-19, T1-21, T1-23, T1-27, T1-29, T1-31, T1-33, T1-35, T1-37, T1-39 and T2-01. The first composite sample was collected from 12—66 inches bgs. These soil samples are denoted with the letter “A” after the soil boring ID. The second composite sample was collected from 66—120 inches bgs. These soil samples are denoted with the letter “B” after the soil boring ID.

RSE collected one composite soil sample from the upper 12—66 inches bgs from soil boring locations T1-15 and T2-03 where mineral soil was encountered at approximately 60 inches bgs.

The RSE field team placed all recoverable soil from each composite sample interval into a clean stainless steel bowl. The soil was then thoroughly mixed. Prior to collecting the PFAS soil sample, RSE quickly collected a soil sample for field-screening, and gasoline range organics (GRO) and benzene, toluene, ethylbenzene and total xylenes (collectively referred to as BTEX) laboratory analysis – discussed below. PFAS soil samples were placed into laboratory provided method specific sample containers. Each sample container was labeled with the soil boring and letter denoting the composite interval and placed into a laboratory provided sample cooler.

At the end of each field day RSE transported the sample cooler(s) under chain of custody to SGS North America Inc. (SGS) located in Anchorage. PFAS soil samples were transferred to a network laboratory located in Orlando, Florida. SGS Orlando analyzed the PFAS soil samples using EPA Method 537M.

## 2.3 Petroleum Hydrocarbon Soil Sampling

The RSE field team collected soil samples for petroleum hydrocarbons from each soil interval prior to field-screening. RSE placed hydrocarbon soil samples into laboratory provided method specific containers using a clean stainless steel spoon. RSE added laboratory provided methanol to the container containing the GRO/BTEX sample. Each sample container was labeled with the soil boring and letter denoting the composite interval and placed into a laboratory provided sample cooler. RSE used a Mini Rae Lite photo-ionization detector (PID) calibrated to 100 ppmv isobutylene to measure the headspace in a quart size Ziploc bag for volatile organic compounds.

At the end of each field day RSE transported the sample cooler(s) under chain of custody to SGS located in Anchorage. The sample interval with the highest PID reading was submitted to SGS for analysis. Soil samples T1-03A, T1-05A, T1-07A, T1-11A, T1-13A, T1-15A, T1-17A, T1-19A, T1-21A, T1-23A, T1-27B, T1-29A, T1-31A, T1-33A, T1-35A, T1-37A, T1-39A, T2-01A, T2-01B and T2-03 were analyzed for GRO by AK Method 101, diesel range organics (DRO) by AK Method 102, residual range organics (RRO) by AK Method 103, and BTEX by EPA Method 8021B.

## 2.2 Work Plan Deviations

RSE proposed collecting PFAS and petroleum hydrocarbon samples from peat soil at 22 soil boring locations within the Postmark Bog Development area. Soil boring locations T1-01, T1-09 and T1-25 consisted of mineral soil and were not sampled. At soil boring locations T1-15 and T2-03, mineral soil was encountered at approximately 60 inches bgs. At these locations only the upper composite interval was sampled.

At certain soil borings a bucket auger was used to collect core samples near the surface rather than the Geoprobe manual slide hammer, hollow probe and disposable cellulose acetate butyrate (CAB) liners. The bucket auger was used when then narrow drive sampler bit would compress the soil around the sample tube rather than capturing the soil sample inside the hollow probe and CAB liner. Also, in certain instances the soil was so wet that the hollow probe and CAB liner did not recover enough soil to collect a sample. In those instances, the bucket auger was also used to capture a larger soil recovery. In all cases, the RSE field team switched over to the Geoprobe manual slide hammer, hollow probe and disposable CAB liner setup within a few feet after starting the soil boring installation.

# 3.0 RESULTS AND FINDINGS

PFAS compounds were detected in 32 of the 36 project primary soil samples and in all five blind duplicate soil samples. Of the regulated PFAS compounds, PFOA was detected in 14 of the primary soil samples (and in four of the blind duplicate soil samples). Twelve of the primary PFOA soil samples and four of the blind duplicate soil samples exceeded the ADEC Method 2 MTG cleanup level of 0.0017 mg/Kg. While PFOS was detected in 28 of the primary soil samples (and in all five of the blind duplicate soil samples). Twenty-five of the primary PFOS soil samples and all five of the blind duplicate soil samples exceeded the ADEC Method 2 MTG cleanup level of 0.0030 mg/Kg. None of the primary or blind duplicate soil samples exceeded the ADEC Human Health cleanup level of 1.6 mg/Kg for PFOA or PFOS.

DRO and RRO were detected in all 20 soil samples (and both blind duplicate samples) sampled for petroleum hydrocarbons. DRO exceeded the ADEC Method 2 MTG cleanup level of 250 mg/Kg in all 22 soil samples. While RRO exceeded the ADEC Method 2 MTG cleanup level of 11000 mg/Kg in seven of the soil samples.

## 3.1 PFAS Results

Detectable PFOA concentrations range from 0.0011 mg/Kg to 0.0333 mg/Kg. At soil boring locations T1-07 (0.0020 mg/Kg), T1-21 (0.0043 mg/Kg), T1-23 (0.0031 mg/Kg), T1-27 (0.0140 mg/Kg), T1-35 (0.0029 mg/Kg), T1-37 (0.0075 mg/Kg), T1-39 (0.0333* mg/Kg), T2-01 (0.0017 mg/Kg) and T2-03 (0.0011 mg/Kg) PFOA was detected in the upper composite sample only. At soil boring locations T1-19 (0.0043* mg/Kg; 0.0052 mg/Kg) and T1-29 (0.0042 mg/Kg; 0.0051 mg/Kg) PFOA was detected in both the upper and lower composite samples. Note that non-detectable results had Limits of Detection (LOD) between 0.0021 mg/Kg and 0.032 mg/Kg – all exceeding the ADEC Method 2 MTG cleanup level but below the ADEC Method 2 Human Health cleanup level.

Detectable PFOS concentrations range from 0.0018 mg/Kg to 1.06 mg/Kg. At soil boring locations T1-05 (0.0898 mg/Kg) and T1-11 (0.0838 mg/Kg) PFOS was detected in the upper composite sample only. At soil borings T1-13 (0.0549 mg/Kg; 0.0568 mg/Kg), T1-15 (0.0083 mg/Kg; NS), T1-19 (0.0909* mg/Kg; 0.154 mg/Kg), T1-21 (0.0790 mg/Kg; 0.0157 mg/Kg), T1-23 (0.0139 mg/Kg; 0.0019 mg/Kg), T1-27 (0.330 mg/Kg; 0.0351 mg/Kg); T1-29 (0.0847 mg/Kg; 0.111 mg/Kg), T1-33 (0.0025 mg/Kg; 0.0018 mg/Kg), T1-35 (0.0436 mg/K; 0.0052 mg/Kg), T1-37 (0.0482 mg/Kg; 0.363 mg/Kg), T1-39 (0.106* mg/Kg; 0.0743 mg/Kg), T2-01 (0.0743 mg/Kg; 0.0056 mg/Kg), T2-03 (0.095 mg/Kg; NS) PFOS was detected in both the upper and lower composite samples. Note that non-detectable results had LOD between 0.0021 mg/Kg and 0.028 mg/Kg

– most exceeding the ADEC Method 2 MTG cleanup level but below the ADEC Method 2 Human Health cleanup level.

Soil sample results for all 24 PFAS compounds for soil borings T1-03 through T2-03 are shown in Tables 1A—1E (Appendix B). * denotes that the sample result is from the corresponding blind duplicate. "NS" means not sampled.

Detectable soil sample results for PFOA and PFOS are shown on Figure 2 (Appendix A).

## 3.2 Hydrocarbon Results

GRO was detected in the composite samples at soil borings soils T1-03 (15.7 mg/Kg), T1-07 (22.8 mg/Kg), T1-33 (20.5 mg/Kg) and T1-39 (15.1 mg/Kg). All GRO soil samples are either non-detect or below the ADEC Method 2 MTG cleanup level of 300 mg/Kg.

Detectable DRO concentrations range from 449 mg/Kg to 1700 mg/Kg. DRO was detected in composite samples exceeding the ADEC Method 2 MTG cleanup level of 250 mg/Kg at all soil boring locations. No DRO soil samples exceed the ADEC Method 2 Maximum Allowable Concentration of 12500 mg/Kg.

Detectable RRO concentrations range from 5980 mg/Kg to 18900 mg/Kg. RRO was detected in composite samples exceeding the ADEC Method 2 MTG cleanup level of 11000 mg/Kg at all soil boring locations T1-03 (17000 mg/Kg), T1-07 (13600 mg/Kg), T1-11 (18900 mg/Kg), T1-23 (14900 mg/Kg), T1-31 (15700 mg/Kg), T1-33 (13300 mg/Kg) and T1-39 (14900* mg/Kg). No RRO soil samples exceed the ADEC Method 2 Maximum Allowable Concentration of 22000 mg/Kg.

Toluene was detected in the composite samples below the ADEC Method 2 MTG cleanup level of 6700 μg/Kg at soil borings soils T1-07 (2160 μg/Kg) and T1-39 (1430 μg/Kg). All other toluene and xylene soil samples are either non-detect with LODs below ADEC Method 2 MTG cleanup level. Note that all non-detectable results for benzene and ethylbenzene and had LODs exceeding their ADEC Method 2 MTG cleanup level but below their ADEC Method 2 Human Health cleanup level.

Soil sample results for all GRO, DRO, RRO and BTEX for soil borings T1-03 through T2-03 are shown in Tables 2A—2B (Appendix B). * denotes that the sample result is from the corresponding blind duplicate.

Detectable petroleum hydrocarbon soil sample results are shown on Figure 3 (Appendix A).

# 4.0 Quality Assurance Assessment

## 4.1 Data Quality

For all non-detect PFOA and PFOS composite samples, the LOQ exceeded the ADEC Method 2 MTG cleanup levels of 0.0017 mg/Kg and 0.0030 mg/Kg, respectively. In Tables 1A—1E (Appendix B), non-detect samples exceeding their ADEC Method 2 MTG cleanup levels are highlighted blue, italicized, accompanied by a U qualifier and show the LOD. Nearly all PFOA and PFOS samples are outside laboratory control limits because of target (PFOA and PFOS) and non-target (other PFAS compounds) matrix interference. In most cases, soil samples were subject to a 10x dilution factor, reanalyzed and the results confirmed.

The relative percent difference (RPD) between T1-19A and its blind duplicate T1-X for both PFOA (77.42%) and PFOS (97.79%) exceed 50%. The PFOA result in T1-19A was subject to a 10x dilution factor, while the

PFOA result in T1-X had a dilution factor of 1x. The RPD between T1-11A and its blind duplicate T1-XX for PFOS (64.92%) exceeded 50%. Also, the RPD between T1-39A and its blind duplicate T1-XXXX for PFOS (97.96%) exceeded 50%. The PFOS result in T1-XXXX was subject to a 10X dilution factor, while the PFOS result in T1-39A had a dilution factor of 1x. Further, the RPD between T1-39A and its blind duplicate T1-YY for RRO (52.44%) slightly exceeded 50%. All other primary sample and corresponding blind duplicate RPD calculations are < 50%. RPD calculations are shown in Table 3 (Appendix B).

For nearly all non-detect benzene and ethylbenzene composite samples, the LOQ exceeded the ADEC Method 2 MTG cleanup levels of 22 μg/Kg and 130 μg/Kg, respectively. In Tables 2A—2B (Appendix B), non-detect samples exceeding their ADEC Method 2 MTG cleanup levels are highlighted blue, italicized, accompanied by a U qualifier and show the LOD.

The temperature blank contained in the sample cooler associated with SGS Work Order 1204021 measured 11.4 °C when delivered to SGS. RSE collected the soil samples < 8 hours prior to delivering the samples coolers to the lab. While the temperature blank is noted as being > 6 °C, the SGS Lab Receipt Form indicates that "exemption permitted if chilled & < 8 hours ago …".

RSE completed the ADEC Laboratory Data Review Checklist for SGS Work Orders 1204021, 1204046, 1204074 and 1204106. SGS Laboratory Soil Sample Data Reports are provided in Appendix E. The ADEC Laboratory Review Checklists are provided in Appendix F.

The data from this investigation is representative of PFAS and petroleum hydrocarbon impacts in soil at the soil boring locations within the Postmark Bog Development area during the site investigation.

### 4.2 Data Usability

The PFAS soil sample data is complete and meets the expected data quality objectives for PFAS contaminant concentrations in highly organic low dry weight soil. Despite LOQs exceeding ADEC Method 2 MTG cleanup levels, PFAS soil sample results are usable for the intended purpose of comparison to ADEC Method 2 MTG and Human Health cleanup levels for PFOA and PFOS.

Similarly, the hydrocarbon soil sample data is complete and meets expected data quality objectives. The hydrocarbon soil sample results are usable for the intended purpose of comparison to ADEC Method 2 MTG and Human Health cleanup levels for GRO, DRO, RRO and BTEX.

## 5.0 INVESTIGATIVE DERIVED WASTE (IDW) MANAGEMENT

### 5.1 Soil

After sample collection all excess soil was placed back into the soil boring of origin. Petroleum hydrocarbon samples not analyzed because of low PID readings were discarded by SGS.

### 5.2 Decon Water

Decon water IDW was treated using a 5-gallon granular activated carbon (GAC) cannister and discharged onsite into the Postmark Bog. The 5-gallon GAC is presently stored at the ANC HazMat Storage Area.

## 5.3 Other IDW

Consumable field items such as plastic bags, nitrile gloves and sample tube liners were placed in a dumpster or other trash bin for disposal. Non-consumables such as stainless-steel spoons and other field equipment was washed using Alconox and hot water at the RSE field equipment room.

# 6.0 DISCUSSION

## 6.1 Soil Physical Properties

Nearly all soil samples are < 30% solids. The soil sample results are reported on a percent solids basis (or “dry” weight) – meaning the laboratory measured the moisture content and calculated the contaminant concentration based on the percent solids rather than reporting the result on a “wet” or “as-is” basis. Data that is not corrected using percent solids is likely biased low because the result may include contamination in the water or other liquid phase in the soil sample.

While low percent solids impact the soil sample results, the data is considered appropriate for its intended use. “Dry” soil bulk density is used in the soil-groundwater partitioning model that is used to determine ADEC Method 2 MTG and ADEC Method 2 Human Health cleanup levels.

## 6.2 Upper Confidence Limit (UCL)

RSE proposed to perform a single-sample hypothesis t-test on both PFOA and PFOS soil sample results to compare the Postmark Bog Development area mean and median values for PFOA and PFOS to ADEC Method 2 MTG and Human Health cleanup levels. However, both data sets contain numerous non-detect (ND) results that exceed the ADEC Method 2 MTG cleanup levels for PFOA and PFOS. The ProUCL Version 5.1 User Guide suggests that all ND data lie below the cleanup standard. Instead, RSE performed an *UCL Statistics for Uncensored Full Data Sets* for normal, gamma, log normal, and non-parametric data sets using ProUCL 5.1 to determine the “Suggested UCL” for both PFOA and PFOS at the Postmark Bog Development area.

### 6.2.1 Data Inputs

RSE used detectable concentrations for PFOA/PFOS when possible. If the blind duplicate PFOA/PFOS value was greater than the primary sample result, the higher concentration was used. RSE followed the ADEC Technical Memorandum for *Treatment of Non-Detects and Blank Detections in Per- and Polyfluoroalkyl Substances (PFAS) Analysis* (ADEC 2019) when inputting ND results for PFOA and PFOS: J-flagged data was used when the reported concentration was between the LOQ and LOD; and the value equal to the LOD was used when PFOA or PFOS were reported as ND at the LOD. A worksheet showing the data inputs are provided in Appendix D.

## 6.2.1 UCL Results

Table A shows the general statistics for detectable and non-detect PFOA/PFOS results from 36 soil samples collected during this investigation.

Table A – General Statistics on Uncensored PFOA/PFAS Soil Data at the Postmark Bog Development Area

| | |
|---|---|
| | **General Statistics on Uncensored Data** |
| Date/Time of Computation | ProUCL 5.19/21/2020 11:09:49 PM |
| **User Selected Options** | |
| From File | Postmark Bog UCL_all data w NDs.xls |
| Full Precision | OFF |

**From File: Postmark Bog UCL_all data w NDs.xls**

**General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method**

| Variable | NumObs | # Missing | Num Ds | NumNDs | % NDs | Min ND | Max ND | KM Mean | KM Var | KM SD | KM CV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PFOA | 36 | 0 | 14 | 22 | 61.11% | 0.0021 | 0.032 | 0.00406 | 3.2367E-5 | 0.00569 | 1.401 |
| PFOS | 36 | 0 | 28 | 8 | 22.22% | 0.0021 | 0.028 | 0.074 | 0.0317 | 0.178 | 2.404 |

**General Statistics for Raw Data Sets using Detected Data Only**

| Variable | NumObs | # Missing | Minimum | Maximum | Mean | Median | Var | SD | MAD/0.675 | Skewness | CV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PFOA | 14 | 0 | 0.0011 | 0.0333 | 0.00644 | 0.00425 | 7.0736E-5 | 0.00841 | 0.00267 | 2.903 | 1.307 |
| PFOS | 28 | 0 | 0.0018 | 1.06 | 0.0935 | 0.0459 | 0.0405 | 0.201 | 0.056 | 4.455 | 2.152 |

**Percentiles using all Detects (Ds) and Non-Detects (NDs)**

| Variable | NumObs | # Missing | 10%ile | 20%ile | 25%ile(Q1) | 50%ile(Q2) | 75%ile(Q3) | 80%ile | 90%ile | 95%ile | 99%ile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PFOA | 36 | 0 | 0.00205 | 0.0026 | 0.00288 | 0.0047 | 0.0188 | 0.021 | 0.028 | 0.029 | 0.0328 |
| PFOS | 36 | 0 | 0.0024 | 0.0083 | 0.00938 | 0.0263 | 0.0802 | 0.0847 | 0.103 | 0.206 | 0.804 |

Table B suggests that the PFOA data from the Postmark Bog is nonparametric and that the 95% ULC is 0.0188 mg/Kg. The suggested 95% UCL for PFOA is significantly less than the ADEC Method 2 Human Health cleanup level of 1.6 mg/Kg.

Table B – Suggested 95% UCL for PFOA at the Postmark Bog Development Area

| UCL Statistics for Uncensored Full Data Sets | | | |
|---|---|---|---|
| User Selected Options | | | |
| Date/Time of Computation | ProUCL 5.19/21/2020 11:30:18 PM | | |
| From File | Postmark Bog UCL_all data w NDs.xls | | |
| Full Precision | OFF | | |
| Confidence Coefficient | 95% | | |
| Number of Bootstrap Operations | 2000 | | |
| PFOA | | | |
| General Statistics | | | |
| Total Number of Observations | 36 | Number of Distinct Observations | 28 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.0011 | Mean | 0.0112 |
| Maximum | 0.0333 | Median | 0.0047 |
| SD | 0.0105 | Std. Error of Mean | 0.00175 |
| Coefficient of Variation | 0.932 | Skewness | 0.795 |
| Nonparametric Distribution Free UCLs | | | |
| 95% CLT UCL | 0.0141 | 95% Jackknife UCL | 0.0142 |
| 95% Standard Bootstrap UCL | 0.014 | 95% Bootstrap-t UCL | 0.0145 |
| 95% Hall's Bootstrap UCL | 0.0143 | 95% Percentile Bootstrap UCL | 0.0141 |
| 95% BCA Bootstrap UCL | 0.0144 | | |
| 90% Chebyshev(Mean, Sd) UCL | 0.0165 | 95% Chebyshev(Mean, Sd) UCL | 0.0188 |
| 97.5% Chebyshev(Mean, Sd) UCL | 0.0221 | 99% Chebyshev(Mean, Sd) UCL | 0.0286 |
| Suggested UCL to Use | | | |
| 95% Chebyshev (Mean, Sd) UCL | 0.0188 | | |
| Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | |
| Recommendations are based upon data size, data distribution, and skewness. | | | |
| These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | |
| However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | |

Table C suggests that the PFOS data from the Postmark Bog is also nonparametric and that the 95% ULC is 0.207 mg/Kg. The suggested 95% UCL for PFOS is significantly less than the ADEC Method 2 Human Health cleanup level of 1.6 mg/Kg.

Table C – Suggested 95% UCL for PFOS at the Postmark Bog Development Area

| PFOS | | | |
|---|---|---|---|
| | | | |
| General Statistics | | | |
| Total Number of Observations | 36 | Number of Distinct Observations | 36 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.0018 | Mean | 0.0765 |
| Maximum | 1.06 | Median | 0.0263 |
| SD | 0.18 | Std. Error of Mean | 0.0299 |
| Coefficient of Variation | 2.348 | Skewness | 5.026 |
| | | | |
| Nonparametric Distribution Free UCLs | | | |
| 95% CLT UCL | 0.126 | 95% Jackknife UCL | 0.127 |
| 95% Standard Bootstrap UCL | 0.126 | 95% Bootstrap-t UCL | 0.269 |
| 95% Hall's Bootstrap UCL | 0.324 | 95% Percentile Bootstrap UCL | 0.135 |
| 95% BCA Bootstrap UCL | 0.16 | | |
| 90% Chebyshev(Mean, Sd) UCL | 0.166 | 95% Chebyshev(Mean, Sd) UCL | 0.207 |
| 97.5% Chebyshev(Mean, Sd) UCL | 0.263 | 99% Chebyshev(Mean, Sd) UCL | 0.374 |
| | | | |
| Suggested UCL to Use | | | |
| 95% Chebyshev (Mean, Sd) UCL | 0.207 | | |
| | | | |
| Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | |
| Recommendations are based upon data size, data distribution, and skewness. | | | |
| These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | |
| However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | |

# 7.0 CONCLUSIONS

Soil sample data suggests PFAS and petroleum hydrocarbon impacts that exceed ADEC Method 2 MTG cleanup levels but below ADEC Method 2 Human Health cleanup levels. PFAS sample data indicates sitewide PFOA and PFOS impacts among the peat soil within the Postmark Bog Development area. PFOS impacts are indicated more frequently than PFOA impacts. PFOS sorbs more readily than PFOA in organic soils (Makselon 2019). RSE used detectable and non-detect PFOA/PFOS data from this investigation to determine the 95% UCL for both PFAS compounds using ProUCL software. In both instances, PFOA and PFOS from this investigation are described as nonparametric. The calculated 95% UCL for PFOA is 0.0188 mg/Kg. While the calculated 95% UCL for PFOS is 0.207 mg/Kg.

PFAS and petroleum hydrocarbon soil sample results are usable for the intended purpose of comparison to ADEC Method 2 MTG and Human Health cleanup levels to support Postmark Bog Development decision making.

This site investigation report was prepared by Lucus Gamble, QEP. Mr. Gamble satisfies the QEP requirements described in 18 AAC 75.

# APPENDICES

Appendix A – Figures

Figure 1. Vicinity Map

Figure 2. PFAS Soil Sample Location Map

Figure 3. Petroleum Hydrocarbon Soil Sample Location Map

Appendix B – Tables

Tables 1A—1E: Per- and Polyfluoroalkyl Substances (PFAS) Concentrations on Soil

Tables 2A—2B: Hydrocarbon Concentrations in Soil

Table 3: Relative Percent Difference (RPD) Calculation Worksheet

Appendix C – Photo Pages

Appendix D – 95% UCL Calc Worksheets

Appendix E – SGS North America Inc. Laboratory Soil Sample Data Reports

Appendix F – ADEC Laboratory Data Review Checklists

Appendix G – Copies of RSE Field Notes

# REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2019, ADEC Technical Memorandum, Treatment of Non-Detect and Blank Detections in Per- and Polyfluoroalkyl Substances (PFAS) Analysis. April 2019.

Makselon, J., 2019, Binding of per- and polyfluoroalkyl substances (PFASs) to organic soil horizons if peat and mor, effect of solution chemistry and soil organic matter comparison, Masters thesis, Examensarbeten, Insitutionen for mark och milijo, SLU, 2019:14. Online publication: http://stud.epsilon.slu.se.

Restoration Science & Engineering, LLC (RSE), 2020A, ANC Peat Disposal Area PFAS Sampling Results, Letter Report. April 11, 2020.

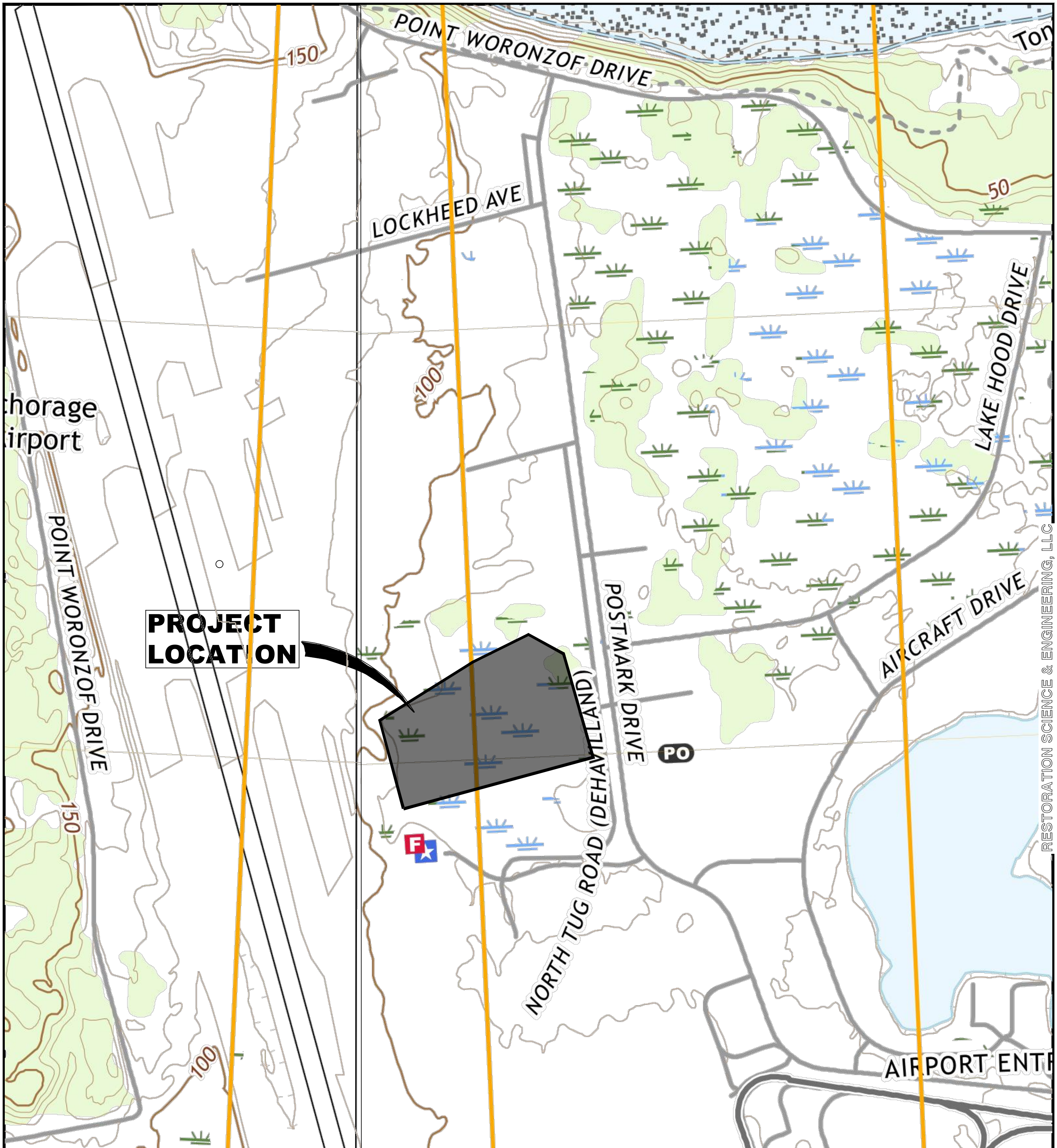
Restoration Science & Engineering, LLC (RSE), 2020B, Ted Stevens Anchorage International Airport Subsurface PFAS Investigation Work Plan, Postmark Bog Development. July 21, 2020.

## Appendix A – Figures

Figure 1. Vicinity Map

Figure 2. PFAS Soil Sample Location Map

Figure 3. Petroleum Hydrocarbon Soil Sample Location Map




COORDINATE SYSTEM: AK83-4F

500 0 1000

GRAPHIC SCALE
1"=1000'

USGS 7.5 MINUTE TOPOGRAPHIC MAPS PROVIDED BY USGS NATIONAL MAPS DIGITAL DOWNLOADS

**ANC POSTMARK BOG DEVELOPMENT PFAS SOIL INVESTIGATION**

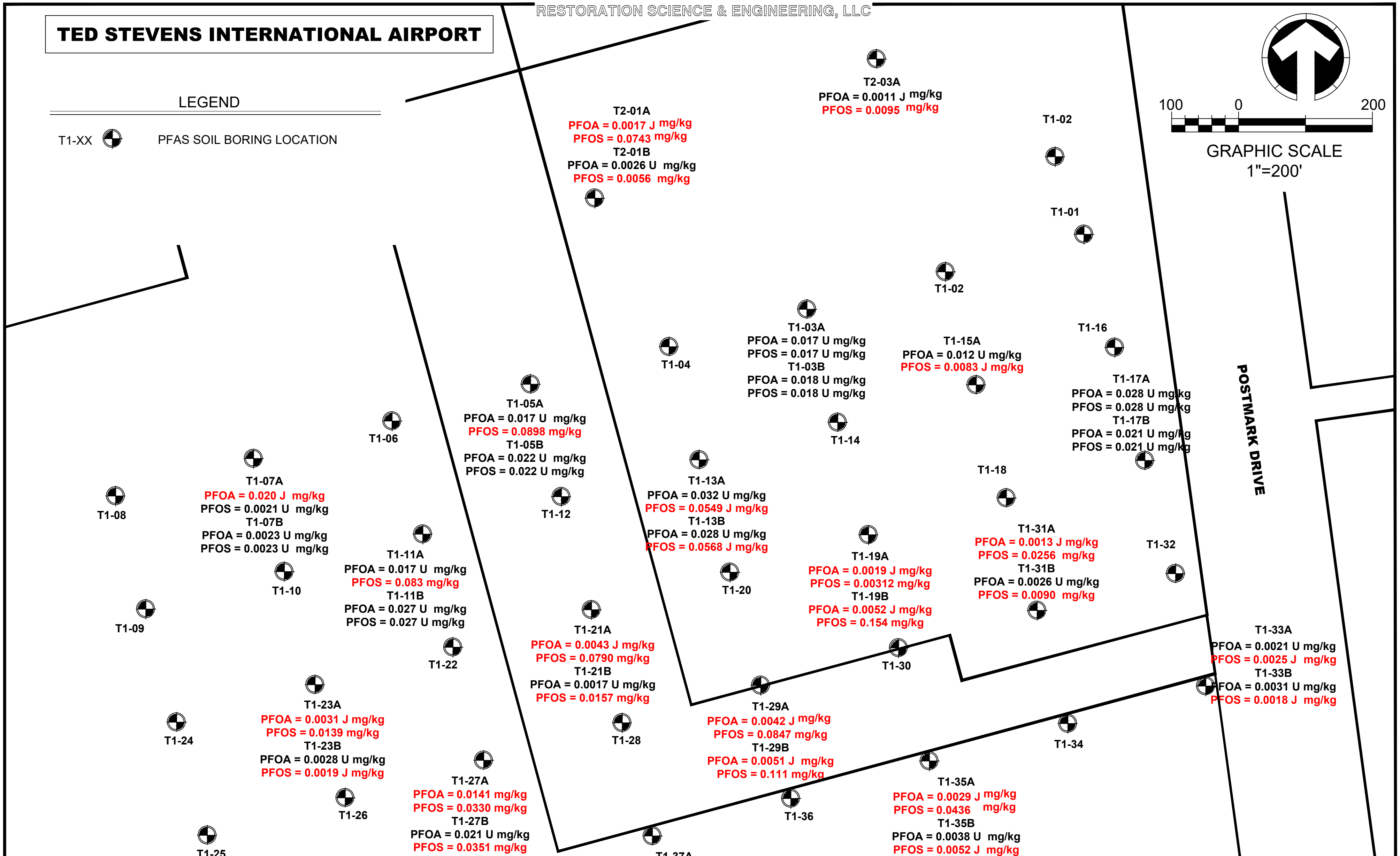
VICINITY MAP

**ANCHORAGE, ALASKA**

RESTORATION Science & Engineering, LLC
911 West 8th Avenue, Suite 100
Anchorage, Alaska 99501
PH (907) 278-1023 FAX (907) 277-5718

| | |
|---|---|
| JOB NO: 20.2176 | DRAWN: MSB |
| DATE: 9.22.2020 | CHECKED: LG |

**FIGURE 1**




**ANC POSTMARK BOG DEVELOPMENT**
**PFAS SOIL SAMPLE LOCATIONS**

SOIL BORING LOCATIONS AND
PFOA & PFOS SAMPLE RESULTS

**ANCHORAGE, ALASKA**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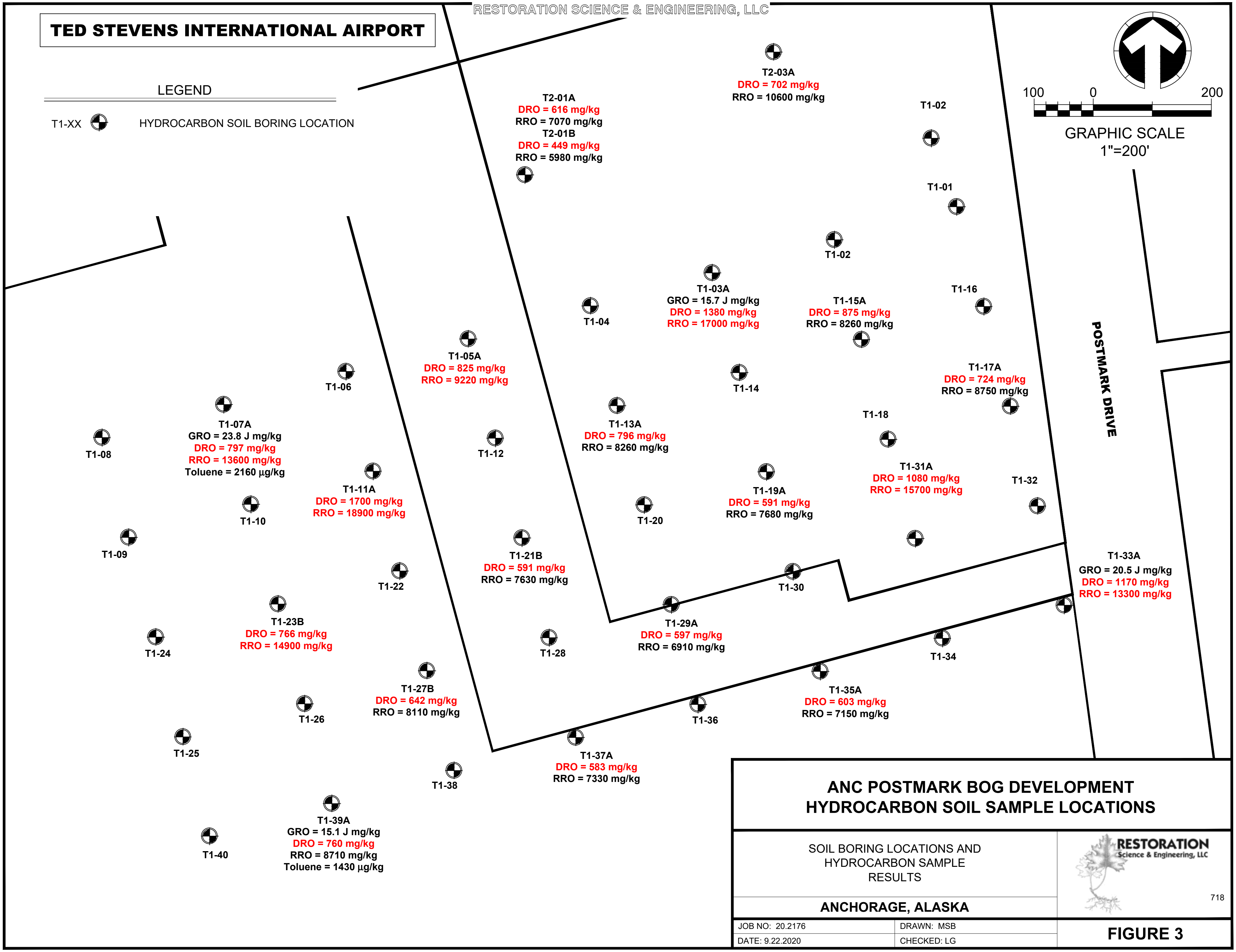
| | |
|---|---|
| JOB NO: 20.2176 | DRAWN: MSB |
| DATE: 9.22.2020 | CHECKED: LG |

**FIGURE 2**


RESTORATION SCIENCE & ENGINEERING, LLC
TED STEVENS INTERNATIONAL AIRPORT
LEGEND
T1-XX HYDROCARBON SOIL BORING LOCATION
100 0 200
GRAPHIC SCALE
1"=200'
T2-03A
DRO = 702 mg/kg
RRO = 10600 mg/kg
T2-01A
DRO = 616 mg/kg
RRO = 7070 mg/kg
T2-01B
DRO = 449 mg/kg
RRO = 5980 mg/kg
T1-02
T1-01
T1-02
T1-03A
GRO = 15.7 J mg/kg
DRO = 1380 mg/kg
RRO = 17000 mg/kg
T1-04
T1-15A
DRO = 875 mg/kg
RRO = 8260 mg/kg
T1-16
POSTMARK DRIVE
T1-05A
DRO = 825 mg/kg
RRO = 9220 mg/kg
T1-06
T1-14
T1-17A
DRO = 724 mg/kg
RRO = 8750 mg/kg
T1-07A
GRO = 23.8 J mg/kg
DRO = 797 mg/kg
RRO = 13600 mg/kg
Toluene = 2160 µg/kg
T1-08
T1-12
T1-13A
DRO = 796 mg/kg
RRO = 8260 mg/kg
T1-18
T1-11A
DRO = 1700 mg/kg
RRO = 18900 mg/kg
T1-31A
DRO = 1080 mg/kg
RRO = 15700 mg/kg
T1-32
T1-10
T1-20
T1-19A
DRO = 591 mg/kg
RRO = 7680 mg/kg
T1-09
T1-21B
DRO = 591 mg/kg
RRO = 7630 mg/kg
T1-33A
GRO = 20.5 J mg/kg
DRO = 1170 mg/kg
RRO = 13300 mg/kg
T1-22
T1-30
T1-23B
DRO = 766 mg/kg
RRO = 14900 mg/kg
T1-24
T1-28
T1-29A
DRO = 597 mg/kg
RRO = 6910 mg/kg
T1-34
T1-27B
DRO = 642 mg/kg
RRO = 8110 mg/kg
T1-35A
DRO = 603 mg/kg
RRO = 7150 mg/kg
T1-26
T1-36
T1-25
T1-37A
DRO = 583 mg/kg
RRO = 7330 mg/kg
T1-38
T1-39A
GRO = 15.1 J mg/kg
DRO = 760 mg/kg
RRO = 8710 mg/kg
Toluene = 1430 µg/kg
T1-40
ANC POSTMARK BOG DEVELOPMENT
HYDROCARBON SOIL SAMPLE LOCATIONS
SOIL BORING LOCATIONS AND
HYDROCARBON SAMPLE
RESULTS
ANCHORAGE, ALASKA
RESTORATION
Science & Engineering, LLC
718
JOB NO: 20.2176
DRAWN: MSB
DATE: 9.22.2020
CHECKED: LG
FIGURE 3

# Appendix B – Tables

Tables 1A—1E: Per- and Polyfluoroalkyl Substances (PFAS) Concentrations on Soil

Tables 2A—2B: Hydrocarbon Concentrations in Soil

Table 3: Relative Percent Difference (RPD) Calculation Worksheet

**TABLE 1A**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**PFAS CONCENTRATIONS IN SOIL**

| PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) CONCENTRATIONS IN SOIL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **T1-03A** | **T1-03B** | **T1-05A** | **T1-05B** | **T1-07A** | **T1-07B** | **T1-11A** | **T1-11B** | **ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS (mg/Kg)** |
| **DATE** | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/10/2020 | 8/10/2020 | 8/7/2020 | 8/7/2020 | |
| **SGS WORK ODER** | 1204046 | 1204046 | 1204046 | 1204046 | 1204074 | 1204074 | 1204046 | 1204046 | |
| **UNITS** | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | |
| **DEPTH (IN. BGS)** | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | |
| **PERCENT SOLIDS (%)** | 28.1 | 21.9 | 23.8 | 21.3 | 20.3 | 18.5 | 24.5 | 16.5 | |
| ***PERFLUOROALKYLCARBOXYLIC ACIDS*** | | | | | | | | | |
| Perfluorobutanoic acid | *0.0017 U* | *0.0018 U* | **0.0012 J** | *0.0022 U* | *0.0021 U* | *0.023 U* | **0.0014 J** | *0.0027 U* | |
| Perfluoropentanoic acid | **0.00080 J** | *0.0018 U* | **0.0048** | *0.0022 U* | **0.0040 J** | **0.0010 J** | *0.017 U* | *0.027 U* | |
| Perfluorohexanoic acid | **0.00072 J** | *0.018 U* | *0.017 U* | *0.0022 U* | **0.0039 J** | **0.0012 J** | **0.0088 J** | *0.027 U* | |
| Perfluoroheptanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | **0.0025 J** | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluorooctanoic acid (PFOA) | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | **0.0020 J** | *0.0023 U* | *0.017 U* | *0.027 U* | **0.0017** |
| Perfluorononanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluorodecanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.023 U* | *0.017 U* | *0.027 U* | |
| Perfluoroundecanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.023 U* | *0.017 U* | *0.027 U* | |
| Perfluorododecanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.023 U* | *0.017 U* | *0.027 U* | |
| Perfluorotridecanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluorotetradecanoic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| ***PERFLUOROALKYLSULFONATES*** | | | | | | | | | |
| Perfluorobutanesulfonic acid | *0.0017 U* | *0.0018 U* | **0.0012 J** | *0.0022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluoropentanesulfonic acid | *0.0017 U* | *0.0018 U* | **0.0015 J** | *0.0022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluorohexanesulfonic acid | **0.0010 J** | *0.018 U* | **0.0138 J** | **0.0016 J** | *0.0021 U* | *0.0023 U* | **0.0169 J** | *0.027 U* | |
| Perfluoroheptanesulfonic acid | *0.0017 U* | *0.018 U* | *0.017 U* | *0.0022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluorooctanesulfonic acid (PFOS) | *0.017 U* | *0.018 U* | **0.0898** | *0.022 U* | *0.0021 U* | *0.0023 U* | **0.0838** | *0.027 U* | **0.0030** |
| Perfluorononanesulfonic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| Perfluorodecanesulfonic acid | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| ***PERFLUOROOCTANESULFONAMIDES*** | | | | | | | | | |
| PFOSA | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.023 U* | *0.017 U* | *0.027 U* | |
| ***PERFLUOROACTANESULFONAMIDOACETIC ACIDS*** | | | | | | | | | |
| MeFOSAA | *0.035 U* | *0.037 U* | *0.034 U* | *0.043 U* | *0.042 U* | *0.0045 U* | *0.035 U* | *0.053 U* | |
| EtFOSAA | *0.035 U* | *0.037 U* | *0.034 U* | *0.043 U* | *0.042 U* | *0.0045 U* | *0.035 U* | *0.053 U* | |
| ***FLUOROTELOMER SULFONATES*** | | | | | | | | | |
| 4:2 Fluorotelomer sulfonate | *0.0017 U* | *0.018 U* | *0.017 U* | *0.0022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| 6:2 Fluorotelomer sulfonate | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |
| 8:2 Fluorotelomer sulfonate | *0.017 U* | *0.018 U* | *0.017 U* | *0.022 U* | *0.0021 U* | *0.0023 U* | *0.017 U* | *0.027 U* | |

**NOTES:**
1) PFAS analysis by EPA 537M
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-X is a blind duplicate of T1-19A; soil sample T1-XX is a blind duplicate of soil sample T1-11A; soil sample T1-XXX is a blind duplicate of T1-27A; soil sample T1-XXXX is a blind duplicate of T1-39A; soil sample T2-X is a blind duplicate of T2-01A.

## TABLE 1B
## CRW ENGINEERING GROUP, LLC
## CRW ANC POSTMARK BOG DEVELOPMENT AREA
## PFAS CONCENTRATIONS IN SOIL

| PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) CONCENTRATIONS IN SOIL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **T1-13A** | **T1-13B** | **T1-15A** | **T1-17A** | **T1-17B** | **T1-19A** | **T1-19B** | **T1-21A** | **T1-21B** | **ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS (mg/Kg)** |
| **DATE** | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | |
| **SGS WORK ODER** | 1204046 | 1204046 | 1204046 | 1204046 | 1204046 | 1204021 | 1204021 | 1204021 | 1204021 | |
| **UNITS** | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | |
| **DEPTH (IN. BGS)** | 12 to 66 | 66 to 120 | 12 to 66 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | |
| **PERCENT SOLIDS (%)** | 14.4 | 17.1 | 39.3 | 17.1 | 19.8 | 14.6 | 10.7 | 18.3 | 11.8 | |
| ***PERFLUOROALKYLCARBOXYLIC ACIDS*** | | | | | | | | | | |
| Perfluorobutanoic acid | **0.0035 J** | **0.0025 J** | **0.00076 J** | *0.0028 U* | *0.0021 U* | **0.0030 J** | **0.0076 J** | **0.0048 J** | *0.0037 U* | |
| Perfluoropentanoic acid | **0.0146** | **0.0105** | **0.0023 J** | *0.028 U* | *0.021 U* | **0.0120** | **0.0247** | **0.0174** | **0.0068 J** | |
| Perfluorohexanoic acid | **0.0168 J** | *0.028 U* | **0.0030** | *0.028 U* | *0.021 U* | **0.0173** | **0.0326** | **0.0220** | **0.0071 J** | |
| Perfluoroheptanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | **0.0079** | **0.0158** | **0.0125** | **0.0026 J** | |
| Perfluorooctanoic acid (PFOA) | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | **0.0019 J** | **0.0052 J** | **0.0043 J** | *0.0037 U* | **0.0017** |
| Perfluorononanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | **0.0025 J** | **0.0015 J** | *0.0037 U* | |
| Perfluorodecanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| Perfluoroundecanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| Perfluorododecanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| Perfluorotridecanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| Perfluorotetradecanoic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| ***PERFLUOROALKYLSULFONATES*** | | | | | | | | | | |
| Perfluorobutanesulfonic acid | **0.0028 J** | **0.0019 J** | *0.0012 U* | *0.028 U* | *0.021 U* | **0.0035 J** | **0.0066 J** | **0.0050** | *0.0037 U* | |
| Perfluoropentanesulfonic acid | **0.0031 J** | **0.0020 J** | *0.0012 U* | *0.028 U* | *0.021 U* | **0.0034 J** | **0.0075 J** | **0.0055** | *0.0037 U* | |
| Perfluorohexanesulfonic acid | **0.0176 J** | *0.028 U* | **0.0030** | *0.028 U* | *0.021 U* | **0.0153** | **0.0385** | **0.0347** | **0.0060 J** | |
| Perfluoroheptanesulfonic acid | *0.032 U* | *0.028 U* | *0.0012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| Perfluorooctanesulfonic acid (PFOS) | **0.0549 J** | **0.0568 J** | **0.0083 J** | *0.028 U* | *0.021 U* | **0.0312** | **0.154** | **0.0790** | **0.0157** | **0.0030** |
| Perfluorononanesulfonic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| Perfluorodecanesulfonic acid | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| ***PERFLUOROOCTANESULFONAMIDES*** | | | | | | | | | | |
| PFOSA | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| ***PERFLUOROACTANESULFONAMIDOACETIC ACIDS*** | | | | | | | | | | |
| MeFOSAA | *0.065 U* | *0.057 U* | *0.024 U* | *0.056 U* | *0.042 U* | *0.0068 U* | *0.0085 U* | *0.0050 U* | *0.0074 U* | |
| EtFOSAA | *0.065 U* | *0.057 U* | *0.024 U* | *0.056 U* | *0.042 U* | *0.0068 U* | *0.0085 U* | *0.0050 U* | *0.0074 U* | |
| ***FLUOROTELOMER SULFONATES*** | | | | | | | | | | |
| 4:2 Fluorotelomer sulfonate | *0.032 U* | *0.028 U* | *0.0012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | *0.0043 U* | *0.0025 U* | *0.0037 U* | |
| 6:2 Fluorotelomer sulfonate | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | **0.0226** | **0.0384** | **0.0298** | **0.0050** | |
| 8:2 Fluorotelomer sulfonate | *0.032 U* | *0.028 U* | *0.012 U* | *0.028 U* | *0.021 U* | *0.0034 U* | **0.0022 J** | *0.0025 U* | *0.0037 U* | |

**NOTES:**

1) PFAS analysis by EPA 537M
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-X is a blind duplicate of T1-19A; soil sample T1-XX is a blind duplicate of soil sample T1-11A; soil sample T1-XXX is a blind duplicate of T1-27A; soil sample T1-XXXX is a blind duplicate of T1-39A; soil sample T2-X is a blind duplicate of T2-01A.

**TABLE 1C**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**PFAS CONCENTRATIONS IN SOIL**

| PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) CONCENTRATIONS IN SOIL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **T1-23A** | **T1-23B** | **T1-27A** | **T1-27B** | **T1-29A** | **T1-29B** | **T1-31A** | **T1-31B** | **ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS (mg/Kg)** |
| **DATE** | 8/10/2020 | 8/10/2020 | 8/10/2020 | 8/10/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | |
| **SGS WORK ODER** | 1204074 | 1204074 | 1204074 | 1204074 | 1204021 | 1204021 | 1204021 | 1204021 | |
| **UNITS** | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | |
| **DEPTH (IN. BGS)** | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | |
| **PERCENT SOLIDS (%)** | 20.3 | 16.3 | 19.5 | 18.9 | 16.2 | 8.7 | 17.3 | 18.3 | |
| ***PERFLUOROALKYLCARBOXYLIC ACIDS*** | | | | | | | | | |
| Perfluorobutanoic acid | **0.0040 J** | *0.0028 U* | **0.0098** | *0.0021 U* | **0.0053 J** | **0.0091 J** | **0.0015 J** | *0.0026 U* | |
| Perfluoropentanoic acid | **0.0187** | **0.0044 J** | **0.0313** | *0.021 U* | **0.0177** | **0.0279** | **0.0050** | **0.0031 J** | |
| Perfluorohexanoic acid | **0.0161** | **0.0028 J** | **0.0472** | *0.021 U* | **0.0275** | **0.0379** | **0.0072** | **0.0034 J** | |
| Perfluoroheptanoic acid | **0.0089** | **0.0015 J** | **0.0198** | *0.021 U* | **0.0112** | **0.0156** | **0.0051** | **0.0022 J** | |
| Perfluorooctanoic acid (PFOA) | **0.0031 J** | *0.0028 U* | **0.0141** | *0.021 U* | **0.0042 J** | **0.0051 J** | **0.0013 J** | *0.0026 U* | **0.0017** |
| Perfluorononanoic acid | *0.0022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluorodecanoic acid | *0.022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluoroundecanoic acid | *0.022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluorododecanoic acid | *0.022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluorotridecanoic acid | *0.022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluorotetradecanoic acid | *0.022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| ***PERFLUOROALKYLSULFONATES*** | | | | | | | | | |
| Perfluorobutanesulfonic acid | **0.0027 J** | *0.0028 U* | **0.0143** | *0.0021 U* | **0.0063** | **0.0094 J** | *0.0025 U* | *0.0026 U* | |
| Perfluoropentanesulfonic acid | **0.0021 J** | *0.0028 U* | **0.0134** | *0.0021 U* | **0.0066** | **0.0084 J** | **0.0014 J** | *0.0026 U* | |
| Perfluorohexanesulfonic acid | *0.0104* | *0.0028 U* | **0.0882** | *0.0056* | **0.0294** | **0.0341** | **0.0080** | **0.0044 J** | |
| Perfluoroheptanesulfonic acid | *0.0022 U* | *0.0028 U* | **0.0079** | *0.0021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluorooctanesulfonic acid (PFOS) | **0.0139** | **0.0019 J** | **0.330** | **0.0351** | **0.0847** | **0.111** | **0.0256** | **0.0090** | **0.0030** |
| Perfluorononanesulfonic acid | *0.0022 U* | *0.0028 U* | *0.0023 U* | *0.0021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| Perfluorodecanesulfonic acid | *0.0022 U* | *0.0028 U* | *0.0023 U* | *0.0021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| ***PERFLUOROOCTANESULFONAMIDES*** | | | | | | | | | |
| PFOSA | *0.022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| ***PERFLUOROACTANESULFONAMIDOACETIC ACIDS*** | | | | | | | | | |
| MeFOSAA | *0.0044 U* | *0.0056 U* | *0.045 U* | *0.041 U* | *0.0055 U* | *0.011 U* | *0.0049 U* | *0.0051 U* | |
| EtFOSAA | *0.0044 U* | *0.0056 U* | *0.045 U* | *0.041 U* | *0.0055 U* | *0.011 U* | *0.0049 U* | *0.0051 U* | |
| ***FLUOROTELOMER SULFONATES*** | | | | | | | | | |
| 4:2 Fluorotelomer sulfonate | *0.0022 U* | *0.0028 U* | *0.0023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |
| 6:2 Fluorotelomer sulfonate | **0.0139** | *0.0028 U* | **0.0658** | **0.0030** | **0.0237** | **0.0106 J** | *0.0025 U* | **0.0028 J** | |
| 8:2 Fluorotelomer sulfonate | *0.0022 U* | *0.028 U* | *0.023 U* | *0.021 U* | *0.0028 U* | *0.0056 U* | *0.0025 U* | *0.0026 U* | |

**NOTES:**
1) PFAS analysis by EPA 537M
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-X is a blind duplicate of T1-19A; soil sample T1-XX is a blind duplicate of soil sample T1-11A; soil sample T1-XXX is a blind duplicate of T1-27A; soil sample T1-XXXX is a blind duplicate of T1-39A; soil sample T2-X is a blind duplicate of T2-01A.

**TABLE 1D**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**PFAS CONCENTRATIONS IN SOIL**

| PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) CONCENTRATIONS IN SOIL | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **T1-33A** | **T1-33B** | **T1-35A** | **T1-35B** | **T1-37A** | **T1-37B** | **T1-39A** | **T1-39B** | **T2-01A** | **T2-01B** | **T2-03A** | **ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS (mg/Kg)** |
| **DATE** | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/10/2020 | 8/10/2020 | 8/11/2020 | 8/11/2020 | 8/11/2020 | |
| **SGS WORK ODER** | 1204021 | 1204021 | 1204021 | 1204021 | 1204021 | 1204021 | 1204074 | 1204074 | 1204107 | 1204107 | 1204107 | |
| **UNITS** | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | |
| **DEPTH (IN. BGS)** | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | 66 to 120 | 12 to 66 | |
| **PERCENT SOLIDS (%)** | 21.5 | 16.3 | 24.9 | 12.4 | 27.4 | 13.5 | 23.1 | 15.1 | 20.9 | 16.6 | 28.5 | |
| ***PERFLUOROALKYLCARBOXYLIC ACIDS*** | | | | | | | | | | | | |
| Perfluorobutanoic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | **0.0020 J** | *0.0035 U* | **0.0119** | **0.0197** | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| Perfluoropentanoic acid | **0.0010 J** | **0.0014 J** | **0.0012 J** | *0.0038 U* | **0.0063** | **0.0054 J** | **0.0302** | **0.0298 J** | *0.022 U* | *0.0026 U* | **0.00085 J** | |
| Perfluorohexanoic acid | **0.0014 J** | *0.0031 U* | **0.0016 J** | *0.0038 U* | **0.0196** | **0.0150** | **0.0671** | **0.0427 J** | *0.022 U* | *0.0026 U* | **0.0011 J** | |
| Perfluoroheptanoic acid | **0.0012 J** | *0.0031 U* | **0.0025 J** | *0.0038 U* | **0.0109** | **0.0042 J** | **0.0211** | *0.028 U* | *0.022 U* | *0.0026 U* | **0.0012 J** | |
| Perfluorooctanoic acid (PFOA) | *0.0021 U* | *0.0031 U* | **0.0029 J** | *0.0038 U* | **0.0075** | *0.0035 U* | **0.0268** | *0.028 U* | **0.0017 J** | *0.0026 U* | **0.0011 J** | **0.0017** |
| Perfluorononanoic acid | *0.0021 U* | *0.0031 U* | **0.0022 J** | *0.0038 U* | **0.0028 J** | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.0026 U* | *0.015 U* | |
| Perfluorodecanoic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.026 U* | *0.015 U* | |
| Perfluoroundecanoic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.0026 U* | *0.015 U* | |
| Perfluorododecanoic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.0026 U* | *0.015 U* | |
| Perfluorotridecanoic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.026 U* | *0.015 U* | |
| Perfluorotetradecanoic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.026 U* | *0.015 U* | |
| ***PERFLUOROALKYLSULFONATES*** | | | | | | | | | | | | |
| Perfluorobutanesulfonic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | **0.0011 J** | *0.0035 U* | **0.0371** | **0.0283 J** | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| Perfluoropentanesulfonic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | **0.0032 J** | *0.0035 U* | **0.0324** | *0.028 U* | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| Perfluorohexanesulfonic acid | **0.0021 J** | *0.0031 U* | **0.0102** | *0.0038 U* | **0.0327** | **0.0079** | **0.263** | **0.0450** | **0.0063** | *0.0026 U* | **0.0055** | |
| Perfluoroheptanesulfonic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | **0.0041** | *0.0035 U* | **0.0151** | **0.0068** | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| Perfluorooctanesulfonic acid (PFOS) | **0.0025 J** | **0.0018 J** | **0.0436** | **0.0052 J** | **0.165** | **0.0482** | **0.363** | **0.0951** | **0.0743** | **0.0056** | **0.0095** | **0.0030** |
| Perfluorononanesulfonic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.0019 U* | *0.0028 U* | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| Perfluorodecanesulfonic acid | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.0019 U* | *0.0028 U* | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| ***PERFLUOROOCTANESULFONAMIDES*** | | | | | | | | | | | | |
| PFOSA | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.026 U* | *0.015 U* | |
| ***PERFLUOROACTANESULFONAMIDOACETIC ACIDS*** | | | | | | | | | | | | |
| MeFOSAA | *0.0042 U* | *0.0061 U* | *0.0039 U* | *0.0075 U* | *0.0036 U* | *0.0070 U* | *0.038 U* | *0.056 U* | *0.044 U* | *0.052 U* | *0.029 U* | |
| EtFOSAA | *0.0042 U* | *0.0061 U* | *0.0039 U* | *0.0075 U* | *0.0036 U* | *0.0070 U* | *0.038 U* | *0.056 U* | *0.044 U* | *0.052 U* | *0.029 U* | |
| ***FLUOROTELOMER SULFONATES*** | | | | | | | | | | | | |
| 4:2 Fluorotelomer sulfonate | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | *0.0018 U* | *0.0035 U* | *0.0019 U* | *0.028 U* | *0.022 U* | *0.0026 U* | *0.0015 U* | |
| 6:2 Fluorotelomer sulfonate | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | **0.0311** | **0.0067** | **0.215** | **0.0637** | *0.0022 U* | *0.0026 U* | *0.0015 U* | |
| 8:2 Fluorotelomer sulfonate | *0.0021 U* | *0.0031 U* | *0.0019 U* | *0.0038 U* | **0.0018 J** | *0.0035 U* | *0.019 U* | *0.028 U* | *0.022 U* | *0.0026 U* | *0.015 U* | |

**NOTES:**
1) PFAS analysis by EPA 537M
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-X is a blind duplicate of T1-19A; soil sample T1-XX is a blind duplicate of soil sample T1-11A; soil sample T1-XXX is a blind duplicate of T1-27A; soil sample T1-XXXX is a blind duplicate of T1-39A; soil sample T2-X is a blind duplicate of T2-01A.

**TABLE 1E**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**PFAS CONCENTRATIONS IN SOIL**

| **SAMPLE ID** | **T1-X** | **T1-XX** | **T1-XXX** | **T1-XXXX** | **T2-X** | |
|---|---|---|---|---|---|---|
| **DATE** | 8/6/2020 | 8/7/2020 | 8/10/2020 | 8/10/2020 | 8/11/2020 | |
| **SGS WORK ODER** | 1204021 | 1204046 | 1204074 | 1204074 | 1204107 | |
| **UNITS** | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | |
| **DEPTH (IN. BGS)** | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | |
| **PERCENT SOLIDS (%)** | 14.8 | 22.8 | 21.7 | 19.3 | 23.9 | |
| ***PERFLUOROALKYLCARBOXYLIC ACIDS*** | | | | | | |
| Perfluorobutanoic acid | **0.0051 J** | **0.0014 J** | **0.0076** | **0.0138** | *0.0017 U* | |
| Perfluoropentanoic acid | **0.0181** | *0.017 U* | **0.0239** | **0.0380** | **0.0014 J** | |
| Perfluorohexanoic acid | **0.0267** | **0.0079 J** | **0.0345** | **0.0744** | **0.0022 J** | |
| Perfluoroheptanoic acid | **0.0135** | *0.017 U* | **0.0136** | **0.0249** | **0.0015 J** | |
| Perfluorooctanoic acid (PFOA) | | | | | | |
| Perfluorononanoic acid | *0.0033 U* | *0.017 U* | **0.0023 J** | *0.021 U* | **0.0012 J** | |
| Perfluorodecanoic acid | *0.0033 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.017 U* | |
| Perfluoroundecanoic acid | *0.0033 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.017 U* | |
| Perfluorododecanoic acid | *0.0033 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.017 U* | |
| Perfluorotridecanoic acid | *0.0033 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.017 U* | |
| Perfluorotetradecanoic acid | *0.0033 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.017 U* | |
| ***PERFLUOROALKYLSULFONATES*** | | | | | | |
| Perfluorobutanesulfonic acid | **0.0053 J** | *0.017 U* | **0.0103** | **0.0361** | *0.0017 U* | |
| Perfluoropentanesulfonic acid | **0.0056 J** | *0.017 U* | **0.0092** | **0.0341** | *0.0017 U* | |
| Perfluorohexanesulfonic acid | **0.0317** | **0.0145 J** | **0.0552** | **0.289** | **0.0069** | |
| Perfluoroheptanesulfonic acid | *0.0033 U* | *0.017 U* | **0.0047** | **0.0298** | *0.0017 U* | |
| Perfluorooctanesulfonic acid (PFOS) | | | | | | |
| Perfluorononanesulfonic acid | *0.0033 U* | *0.017 U* | *0.0022 U* | **0.0039 J** | *0.0017 U* | |
| Perfluorodecanesulfonic acid | *0.0033 U* | *0.017 U* | *0.0022 U* | *0.0021 U* | *0.0017 U* | |
| ***PERFLUOROOCTANESULFONAMIDES*** | | | | | | |
| PFOSA | *0.0033 U* | *0.017 U* | *0.022 U* | *0.021 U* | *0.017 U* | |
| ***PERFLUOROACTANESULFONAMIDOACETIC ACIDS*** | | | | | | |
| MeFOSAA | *0.0066 U* | *0.034 U* | *0.044 U* | *0.042 U* | *0.035 U* | |
| EtFOSAA | *0.0066 U* | *0.034 U* | *0.044 U* | *0.042 U* | *0.035 U* | |
| ***FLUOROTELOMER SULFONATES*** | | | | | | |
| 4:2 Fluorotelomer sulfonate | *0.0033 U* | *0.017 U* | *0.0022 U* | *0.0021 U* | *0.0017 U* | |
| 6:2 Fluorotelomer sulfonate | **0.0389** | *0.017 U* | **0.0375** | **0.248** | *0.0017 U* | |
| 8:2 Fluorotelomer sulfonate | **0.0019 J** | *0.017 U* | *0.0022 U* | **0.0089** | *0.017 U* | |

**NOTES:**
1) PFAS analysis by EPA 537M
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-X is a blind duplicate of T1-19A; soil sample T1-XX is a blind duplicate of soil sample T1-11A; soil sample T1-XXX is a blind duplicate of T1-27A; soil sample T1-XXXX is a blind duplicate of T1-39A; soil sample T2-X is a blind duplicate of T2-01A.

**TABLE 2A**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**HYDROCARBON CONCENTRATIONS IN SOIL**

| HYDROCARBON CONCENTRATIONS IN SOIL | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **T1-03A** | **T1-05A** | **T1-07A** | **T1-11A** | **T1-13A** | **T1-15A** | **T1-17A** | **T1-19A** | **T1-21B** | **T1-23B** | **ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS** |
| **DATE** | 8/7/2020 | 8/7/2020 | 8/10/2020 | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/7/2020 | 8/6/2020 | 8/7/2020 | 8/10/2020 | |
| **SGS WORK ODER** | 1204046 | 1204046 | 1204074 | 1204046 | 1204046 | 1204046 | 1204046 | 1204021 | 1204021 | 1204074 | |
| **DEPTH (IN. BGS)** | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 66 to 120 | 66 to 120 | |
| **PID (PPMV)** | 1.2 | 1.2 | 4.2 | 2.8 | 0.9 | 0.7 | 0.7 | 0.3 | 1.3 | 1.0 | |
| **PERCENT SOLIDS (%)** | 27.9 | 21.4 | 20.3 | 22.4 | 14.4 | 46.8 | 21.2 | 14.2 | 13.9 | 22.2 | |
| ***PETROLUEM HYDROCARBONS*** | | | | | | | | | | | |
| Gasoline Range Organics (mg/Kg) | **15.7 J** | *23.9 U* | **22.8 J** | *24.0 U* | *39.8 U* | *13.3 U* | *32.0 U* | *40.9 U* | *36.6 U* | *41.1 U* | **300** |
| Diesel Range Organics (mg/Kg) | **1380** | **825** | **797** | **1700** | **796** | **875** | **724** | **682** | **591** | **766** | **250** |
| Residual Range Organics (mg/Kg) | **17000** | **9220** | **13600** | **18900** | **9240** | **8260** | **8750** | **7680** | **7630** | **14900** | **11000** |
| ***VOLATILE ORGANIC COMPOUNDS*** | | | | | | | | | | | |
| Benzene (µg/Kg) | *109 U* | *120 U* | *130 U* | *120 U* | *199 U* | *66.5 U* | *160 U* | *205 U* | *184 U* | *207 U* | **22** |
| Ethylbenzene (µg/Kg) | *218 U* | *239 U* | *260 U* | *240 U* | *398 U* | *133 U* | *320 U* | *409 U* | *367 U* | *414 U* | **130** |
| o-Xylene (µg/Kg) | *218 U* | *239 U* | *260 U* | *240 U* | *398 U* | *133 U* | *320 U* | *409 U* | *367 U* | *414 U* | |
| P & M-Xylene (µg/Kg) | *437 U* | *477 U* | *520 U* | *481 U* | *795 U* | *267 U* | *640 U* | *820 U* | *735 U* | *830 U* | |
| Toluene (µg/Kg) | *218 U* | *239 U* | **2160** | *240 U* | *398 U* | *133 U* | *320 U* | *409 U* | *367 U* | *414 U* | **6700** |
| Total Xylenes (µg/Kg) | *655 U* | *715 U* | *780 U* | *720 U* | *1190 U* | *400 U* | *960 U* | *1225 U* | *1100 U* | *1240 U* | **1500** |
| ***TOTAL ORGANIC CARBON*** | | | | | | | | | | | |
| TOC (%) | **33.8** | **33** | **37.9** | **40.3** | **37.4** | **25.0** | **34.4** | **37.7** | **36.3** | **34.9** | |

**NOTES:**

1) GRO analysis by AK 101; DRO analysis by AK 102; RRO analysis by AK 103; BTEX analysis by EPA 8021B; TOC analysis by 9060A.
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-Y is a blind duplicate of T1-19A; soil sample T1-YY is a blind duplicate of T1-39A.

**TABLE 2B**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**HYDROCARBON CONCENTRATIONS IN SOIL**

| HYDROCARBON CONCENTRATIONS IN SOIL | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **T1-27B** | **T1-29A** | **T1-31A** | **T1-33A** | **T1-35A** | **T1-37A** | **T1-39A** | **T2-01A** | **T2-01B** | **T2-03A** | **T1-Y** | **T1-YY** | **ADEC TABLE B1 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS** |
| **DATE** | 8/10/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/6/2020 | 8/10/2020 | 8/11/2020 | 8/11/2020 | 8/11/2020 | 8/6/2020 | 8/10/2020 | |
| **SGS WORK ODER** | 1204074 | 1204021 | 1204021 | 1204021 | 1204021 | 1204021 | 1204074 | 1204107 | 1204107 | 1204107 | 1204021 | 1204074 | |
| **DEPTH (IN. BGS)** | 66 to 120 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 12 to 66 | 66 to 120 | 12 to 66 | 12 to 66 | 12 to 66 | |
| **PID (PPMV)** | 1.0 | 1.8 | 0.9 | 0.9 | 1.1 | 2.0 | 3.7 | 0.4 | 0.5 | 0.4 | 0.3 | 3.7 | |
| **PERCENT SOLIDS (%)** | 15.9 | 14.4 | 17.4 | 27.3 | 23.9 | 26.1 | 19.1 | 22.5 | 23.1 | 27.2 | 14.3 | 21.7 | |
| ***PETROLUEM HYDROCARBONS*** | | | | | | | | | | | | | |
| Gasoline Range Organics (mg/Kg) | *46.4 U* | *33.0 U* | *32.5 U* | **20.5 J** | *57.0 U* | *37.1 U* | **15.1 J** | *22.8 U* | *25.8 U* | *21.9 U* | *23.8 U* | **14.8 J** | **300** |
| Diesel Range Organics (mg/Kg) | **642** | **597** | **1080** | **1170** | **603** | **583** | **760** | **616** | **449** | **702** | **690** | **1250** | **250** |
| Residual Range Organics (mg/Kg) | **8110** | **6910** | **15700** | **13300** | **7150** | **7330** | **8710** | **7070** | **5980** | **10600** | **8090** | **14900** | **11000** |
| ***VOLATILE ORGANIC COMPOUNDS*** | | | | | | | | | | | | | |
| Benzene (µg/Kg) | *232 U* | *165 U* | *238 U* | *111 U* | *284 U* | *186 U* | *119 U* | *114 U* | *129 U* | *109 U* | *119 U* | *114 U* | **22** |
| Ethylbenzene (µg/Kg) | *464 U* | *330 U* | *478 U* | *222 U* | *570 U* | *372 U* | *238 U* | *228 U* | *258 U* | *219 U* | *238 U* | *227 U* | **130** |
| o-Xylene (µg/Kg) | *464 U* | *330 U* | *478 U* | *222 U* | *570 U* | *372 U* | *238 U* | *228 U* | *258 U* | *219 U* | *238 U* | *227 U* | |
| P & M-Xylene (µg/Kg) | *930 U* | *660 U* | *955 U* | *444 U* | *1135 U* | *745 U* | *476 U* | *455 U* | *515 U* | *437 U* | *475 U* | *454 U* | |
| Toluene (µg/Kg) | *464 U* | *330 U* | *478 U* | *222 U* | *570 U* | *372 U* | **1430** | *228 U* | *258 U* | *219 U* | *238 U* | **971** | **6700** |
| Total Xylenes (µg/Kg) | *1390 U* | *990 U* | *1430 U* | *665 U* | *1705 U* | *1115 U* | *715 U* | *685 U* | *775 U* | *655 U* | *710 U* | *680 U* | **1500** |
| ***TOTAL ORGANIC CARBON*** | | | | | | | | | | | | | |
| TOC (%) | **45.1** | **38.4** | **36.4** | **33.2** | **36.9** | **32.1** | **37.1** | **36.0** | **35.7** | **42.6** | **37.2** | **41.8** | |

**NOTES:**

1) GRO analysis by AK 101; DRO analysis by AK 102; RRO analysis by AK 103; BTEX analysis by EPA 8021B; TOC analysis by 9060A.
2) "mg/Kg" means "milligrams per kilogram".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table B1 Cleanup Level.
7) Blue highlighting indicates the analyte was non-detected but the limit of detection was above the ADEC Table B1 Cleanup Level.
8) Soil sample T1-Y is a blind duplicate of T1-19A; soil sample T1-YY is a blind duplicate of T1-39A.

**TABLE 3**
**CRW ENGINEERING GROUP, LLC**
**CRW ANC POSTMARK BOG DEVELOPMENT AREA**
**RELATIVE PERCENT DIFFERENCE CALCULATIONS**

| PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) RPDs | | |
|---|---|---|
| **CONTAMINANT** | **PFOA (mg/Kg)** | **PFOS (mg/Kg)** |
| T1-19A | 0.0019 | 0.0312 |
| T1-X | 0.0043 | 0.0909 |
| *RPD (%)* | *77.42%* | *97.79%* |
| T1-11A | ND | 0.0808 |
| T1-XX | ND | 0.0412 |
| *RPD (%)* | -- | *64.92%* |
| T1-27A | 0.0141 | 0.330 |
| T1-XXX | 0.0086 | 0.242 |
| *RPD (%)* | *48.46%* | *30.77%* |
| T1-39A | 0.0268 | 0.363 |
| T1-XXXX | 0.0333 | 1.06 |
| *RPD (%)* | *21.63%* | *97.96%* |
| T2-01A | 0.017 | 0.0743 |
| T2-X | 0.017 | 0.0777 |
| *RPD (%)* | *0.00%* | *4.47%* |

| HYDROCARBON RPDs | | | |
|---|---|---|---|
| **CONTAMINANT** | **DRO (mg/kg)** | **RRO (mg/Kg)** | **TOLUENE (μg/Kg)** |
| T1-19A | 682 | 7680 | ND |
| T1-Y | 690 | 8090 | ND |
| *RPD (%)* | *1.17%* | *5.20%* | -- |
| T1-39A | 760 | 8710 | 1430 |
| T1-YY | 1250 | 14900 | 971 |
| *RPD (%)* | 48.76% | 52.44% | *38.23%* |

**NOTES:**

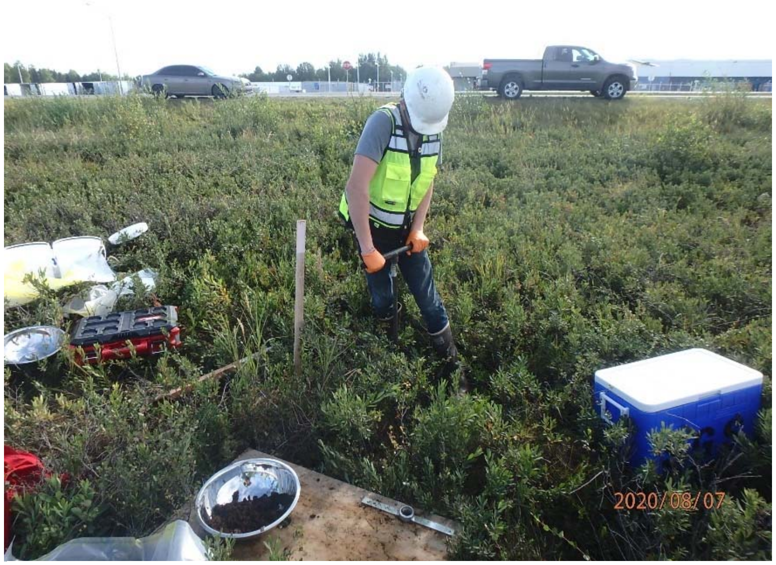
# Appendix C – Photo Pages


Typical field equipment and sampling setup at the Postmark Bog


Typical sampling recovery using the drive hammer and PFAS-free liners


Generally, soil samples had low % solids. However, drier soil persisted near established vegetation


PFAS-free liner with highly compacted peat. Notice the slight bulge




A bucket auger was used at this location because of too compaction issues using the drive sampler


Typical field equipment mobilization and sampling setup at the Postmark Bog


Depending upon material wetness, RSE sometimes sampled using a bucket auger


IDW decon water treatment using a 5-gallon GAC and onsite disposal

# Appendix D – 95% UCL Calc Worksheets

| | A | B | C | D |
|---|---|---|---|---|
| 1 | PFOA | D_PFOA | PFOS | D_PFOS |
| 2 | 0.017 | 0 | 0.017 | 0 |
| 3 | 0.018 | 0 | 0.018 | 0 |
| 4 | 0.017 | 0 | 0.0898 | 1 |
| 5 | 0.022 | 0 | 0.022 | 0 |
| 6 | 0.002 | 1 | 0.0021 | 0 |
| 7 | 0.0023 | 0 | 0.0023 | 0 |
| 8 | 0.017 | 0 | 0.0838 | 1 |
| 9 | 0.027 | 0 | 0.027 | 0 |
| 10 | 0.032 | 0 | 0.0549 | 1 |
| 11 | 0.028 | 0 | 0.0568 | 1 |
| 12 | 0.012 | 0 | 0.0083 | 1 |
| 13 | 0.028 | 0 | 0.028 | 0 |
| 14 | 0.021 | 0 | 0.021 | 0 |
| 15 | 0.0043 | 1 | 0.0909 | 1 |
| 16 | 0.0052 | 1 | 0.0154 | 1 |
| 17 | 0.0043 | 1 | 0.079 | 1 |
| 18 | 0.0037 | 0 | 0.0157 | 1 |
| 19 | 0.0031 | 1 | 0.0139 | 1 |
| 20 | 0.0028 | 0 | 0.0019 | 1 |
| 21 | 0.0141 | 1 | 0.33 | 1 |
| 22 | 0.021 | 0 | 0.0351 | 1 |
| 23 | 0.0042 | 1 | 0.0847 | 1 |
| 24 | 0.0051 | 1 | 0.111 | 1 |
| 25 | 0.0013 | 1 | 0.0256 | 1 |
| 26 | 0.0026 | 0 | 0.009 | 1 |
| 27 | 0.0021 | 0 | 0.0025 | 1 |
| 28 | 0.0031 | 0 | 0.0018 | 1 |
| 29 | 0.0029 | 1 | 0.0436 | 1 |
| 30 | 0.0038 | 0 | 0.0052 | 1 |
| 31 | 0.0075 | 1 | 0.165 | 1 |
| 32 | 0.0035 | 0 | 0.0482 | 1 |
| 33 | 0.0333 | 1 | 1.06 | 1 |
| 34 | 0.028 | 0 | 0.0951 | 1 |
| 35 | 0.0017 | 1 | 0.0743 | 1 |
| 36 | 0.0026 | 0 | 0.0056 | 1 |
| 37 | 0.0011 | 1 | 0.0095 | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | General Statistics on Uncensored Data | | | | | | | | | |
| | Date/Time of Computation | | ProUCL 5.19/21/2020 11:09:49 PM | | | | | | | | | |
| | User Selected Options | | | | | | | | | | | |
| | From File | | Postmark Bog UCL_all data w NDs.xls | | | | | | | | | |
| | Full Precision | | OFF | | | | | | | | | |

From File: Postmark Bog UCL_all data w NDs.xls

General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method

| Variable | NumObs | # Missing | Num Ds | NumNDs | % NDs | Min ND | Max ND | KM Mean | KM Var | KM SD | KM CV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PFOA | 36 | 0 | 14 | 22 | 61.11% | 0.0021 | 0.032 | 0.00406 | 3.2367E-5 | 0.00569 | 1.401 |
| PFOS | 36 | 0 | 28 | 8 | 22.22% | 0.0021 | 0.028 | 0.074 | 0.0317 | 0.178 | 2.404 |

General Statistics for Raw Data Sets using Detected Data Only

| Variable | NumObs | # Missing | Minimum | Maximum | Mean | Median | Var | SD | MAD/0.675 | Skewness | CV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PFOA | 14 | 0 | 0.0011 | 0.0333 | 0.00644 | 0.00425 | 7.0736E-5 | 0.00841 | 0.00267 | 2.903 | 1.307 |
| PFOS | 28 | 0 | 0.0018 | 1.06 | 0.0935 | 0.0459 | 0.0405 | 0.201 | 0.056 | 4.455 | 2.152 |

Percentiles using all Detects (Ds) and Non-Detects (NDs)

| Variable | NumObs | # Missing | 10%ile | 20%ile | 25%ile(Q1) | 50%ile(Q2) | 75%ile(Q3) | 80%ile | 90%ile | 95%ile | 99%ile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PFOA | 36 | 0 | 0.00205 | 0.0026 | 0.00288 | 0.0047 | 0.0188 | 0.021 | 0.028 | 0.029 | 0.0328 |
| PFOS | 36 | 0 | 0.0024 | 0.0083 | 0.00938 | 0.0263 | 0.0802 | 0.0847 | 0.103 | 0.206 | 0.804 |

| | | | |
|---|---|---|---|
| **UCL Statistics for Uncensored Full Data Sets** | | | |
| | | | |
| User Selected Options | | | |
| Date/Time of Computation | ProUCL 5.19/21/2020 11:30:18 PM | | |
| From File | Postmark Bog UCL_all data w NDs.xls | | |
| Full Precision | OFF | | |
| Confidence Coefficient | 95% | | |
| Number of Bootstrap Operations | 2000 | | |
| | | | |
| | | | |
| PFOA | | | |
| | | | |
| **General Statistics** | | | |
| Total Number of Observations | 36 | Number of Distinct Observations | 28 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.0011 | Mean | 0.0112 |
| Maximum | 0.0333 | Median | 0.0047 |
| SD | 0.0105 | Std. Error of Mean | 0.00175 |
| Coefficient of Variation | 0.932 | Skewness | 0.795 |
| | | | |
| **Normal GOF Test** | | | |
| Shapiro Wilk Test Statistic | 0.813 | **Shapiro Wilk GOF Test** | |
| 5% Shapiro Wilk Critical Value | 0.935 | Data Not Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.273 | **Lilliefors GOF Test** | |
| 5% Lilliefors Critical Value | 0.145 | Data Not Normal at 5% Significance Level | |
| **Data Not Normal at 5% Significance Level** | | | |
| | | | |
| **Assuming Normal Distribution** | | | |
| **95% Normal UCL** | | **95% UCLs (Adjusted for Skewness)** | |
| 95% Student's-t UCL | 0.0142 | 95% Adjusted-CLT UCL (Chen-1995) | 0.0144 |
| | | 95% Modified-t UCL (Johnson-1978) | 0.0142 |
| | | | |
| **Gamma GOF Test** | | | |
| A-D Test Statistic | 1.7 | **Anderson-Darling Gamma GOF Test** | |
| 5% A-D Critical Value | 0.774 | Data Not Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.209 | **Kolmogorov-Smirnov Gamma GOF Test** | |
| 5% K-S Critical Value | 0.151 | Data Not Gamma Distributed at 5% Significance Level | |
| **Data Not Gamma Distributed at 5% Significance Level** | | | |
| | | | |
| **Gamma Statistics** | | | |
| k hat (MLE) | 1.128 | k star (bias corrected MLE) | 1.053 |
| Theta hat (MLE) | 0.00996 | Theta star (bias corrected MLE) | 0.0107 |
| nu hat (MLE) | 81.24 | nu star (bias corrected) | 75.8 |
| MLE Mean (bias corrected) | 0.0112 | MLE Sd (bias corrected) | 0.011 |
| | | Approximate Chi Square Value (0.05) | 56.75 |
| Adjusted Level of Significance | 0.0428 | Adjusted Chi Square Value | 56 |
| | | | |
| **Assuming Gamma Distribution** | | | |
| 95% Approximate Gamma UCL (use when n>=50)) | 0.015 | 95% Adjusted Gamma UCL (use when n<50) | 0.0152 |
| | | | |
| **Lognormal GOF Test** | | | |
| Shapiro Wilk Test Statistic | 0.899 | **Shapiro Wilk Lognormal GOF Test** | |
| 5% Shapiro Wilk Critical Value | 0.935 | Data Not Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.167 | **Lilliefors Lognormal GOF Test** | |

| | | | |
|---|---|---|---|
| 5% Lilliefors Critical Value | 0.145 | Data Not Lognormal at 5% Significance Level | |

**Data Not Lognormal at 5% Significance Level**

**Lognormal Statistics**

| | | | |
|---|---|---|---|
| Minimum of Logged Data | -6.812 | Mean of logged Data | -4.993 |
| Maximum of Logged Data | -3.402 | SD of logged Data | 1.065 |

**Assuming Lognormal Distribution**

| | | | |
|---|---|---|---|
| 95% H-UCL | 0.0186 | 90% Chebyshev (MVUE) UCL | 0.019 |
| 95% Chebyshev (MVUE) UCL | 0.0223 | 97.5% Chebyshev (MVUE) UCL | 0.0269 |
| 99% Chebyshev (MVUE) UCL | 0.0359 | | |

**Nonparametric Distribution Free UCL Statistics**

**Data do not follow a Discernible Distribution (0.05)**

**Nonparametric Distribution Free UCLs**

| | | | |
|---|---|---|---|
| 95% CLT UCL | 0.0141 | 95% Jackknife UCL | 0.0142 |
| 95% Standard Bootstrap UCL | 0.014 | 95% Bootstrap-t UCL | 0.0145 |
| 95% Hall's Bootstrap UCL | 0.0143 | 95% Percentile Bootstrap UCL | 0.0141 |
| 95% BCA Bootstrap UCL | 0.0144 | | |
| 90% Chebyshev(Mean, Sd) UCL | 0.0165 | 95% Chebyshev(Mean, Sd) UCL | 0.0188 |
| 97.5% Chebyshev(Mean, Sd) UCL | 0.0221 | 99% Chebyshev(Mean, Sd) UCL | 0.0286 |

**Suggested UCL to Use**

| | | | |
|---|---|---|---|
| 95% Chebyshev (Mean, Sd) UCL | 0.0188 | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

PFOS

**General Statistics**

| | | | |
|---|---|---|---|
| Total Number of Observations | 36 | Number of Distinct Observations | 36 |
| | | Number of Missing Observations | 0 |
| Minimum | 0.0018 | Mean | 0.0765 |
| Maximum | 1.06 | Median | 0.0263 |
| SD | 0.18 | Std. Error of Mean | 0.0299 |
| Coefficient of Variation | 2.348 | Skewness | 5.026 |

**Normal GOF Test**

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.398 | **Shapiro Wilk GOF Test** | |
| 5% Shapiro Wilk Critical Value | 0.935 | Data Not Normal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.348 | **Lilliefors GOF Test** | |
| 5% Lilliefors Critical Value | 0.145 | Data Not Normal at 5% Significance Level | |

**Data Not Normal at 5% Significance Level**

**Assuming Normal Distribution**

| **95% Normal UCL** | | **95% UCLs (Adjusted for Skewness)** | |
|---|---|---|---|
| 95% Student's-t UCL | 0.127 | 95% Adjusted-CLT UCL (Chen-1995) | 0.153 |
| | | 95% Modified-t UCL (Johnson-1978) | 0.131 |

**Gamma GOF Test**

| | | | |
|---|---|---|---|
| A-D Test Statistic | 1.17 | **Anderson-Darling Gamma GOF Test** | |
| 5% A-D Critical Value | 0.806 | Data Not Gamma Distributed at 5% Significance Level | |
| K-S Test Statistic | 0.159 | **Kolmogorov-Smirnov Gamma GOF Test** | |
| 5% K-S Critical Value | 0.155 | Data Not Gamma Distributed at 5% Significance Level | |

**Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics**

| | | | |
|---|---|---|---|
| k hat (MLE) | 0.565 | k star (bias corrected MLE) | 0.537 |
| Theta hat (MLE) | 0.135 | Theta star (bias corrected MLE) | 0.143 |
| nu hat (MLE) | 40.71 | nu star (bias corrected) | 38.65 |
| MLE Mean (bias corrected) | 0.0765 | MLE Sd (bias corrected) | 0.104 |
| | | Approximate Chi Square Value (0.05) | 25.41 |
| Adjusted Level of Significance | 0.0428 | Adjusted Chi Square Value | 24.92 |

**Assuming Gamma Distribution**

| | | | |
|---|---|---|---|
| 95% Approximate Gamma UCL (use when n>=50)) | 0.116 | 95% Adjusted Gamma UCL (use when n<50) | 0.119 |

**Lognormal GOF Test**

| | | | |
|---|---|---|---|
| Shapiro Wilk Test Statistic | 0.967 | **Shapiro Wilk Lognormal GOF Test** | |
| 5% Shapiro Wilk Critical Value | 0.935 | Data appear Lognormal at 5% Significance Level | |
| Lilliefors Test Statistic | 0.0796 | **Lilliefors Lognormal GOF Test** | |
| 5% Lilliefors Critical Value | 0.145 | Data appear Lognormal at 5% Significance Level | |

**Data appear Lognormal at 5% Significance Level**

**Lognormal Statistics**

| | | | |
|---|---|---|---|
| Minimum of Logged Data | -6.32 | Mean of logged Data | -3.673 |
| Maximum of Logged Data | 0.0583 | SD of logged Data | 1.501 |

**Assuming Lognormal Distribution**

| | | | |
|---|---|---|---|
| 95% H-UCL | 0.168 | 90% Chebyshev (MVUE) UCL | 0.145 |
| 95% Chebyshev (MVUE) UCL | 0.177 | 97.5% Chebyshev (MVUE) UCL | 0.222 |
| 99% Chebyshev (MVUE) UCL | 0.31 | | |

**Nonparametric Distribution Free UCL Statistics**

**Data appear to follow a Discernible Distribution at 5% Significance Level**

**Nonparametric Distribution Free UCLs**

| | | | |
|---|---|---|---|
| 95% CLT UCL | 0.126 | 95% Jackknife UCL | 0.127 |
| 95% Standard Bootstrap UCL | 0.126 | 95% Bootstrap-t UCL | 0.269 |
| 95% Hall's Bootstrap UCL | 0.324 | 95% Percentile Bootstrap UCL | 0.135 |
| 95% BCA Bootstrap UCL | 0.16 | | |
| 90% Chebyshev(Mean, Sd) UCL | 0.166 | 95% Chebyshev(Mean, Sd) UCL | 0.207 |
| 97.5% Chebyshev(Mean, Sd) UCL | 0.263 | 99% Chebyshev(Mean, Sd) UCL | 0.374 |

**Suggested UCL to Use**

| | | | |
|---|---|---|---|
| 95% Chebyshev (Mean, Sd) UCL | 0.207 | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

## Appendix E – SGS North America Inc. Laboratory Soil Sample Data Reports

**Laboratory Report of Analysis**

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501

Report Number: **1204021**

Client Project: **20-2176 CRW Postmark Bog V2**

Dear Kyle Wiseman,

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 ten 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 Chuck 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.

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

## Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1204021**
Project Name/Site: **20-2176 CRW Postmark Bog V2**
Project Contact: **Kyle Wiseman**

Refer to sample receipt form for information on sample condition.

**T1-19A (1204021001) PS**

EPA 537 PFAS was analyzed by SGS of Orlando, FL.

**T1-31A (1204021007) PS**

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. The analyte associated with this sample was not detected above the LOQ.

**T1-33A (1204021009) PS**

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. The analyte associated with this sample was not detected above the LOQ.

*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. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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/CVA/CVB | Continuing Calibration Verification |
| CCCV/CVC/CVCA/CVCB | Closing Continuing Calibration Verification |
| CL | Control Limit |
| DF | Analytical Dilution Factor |
| DL | Detection Limit (i.e., maximum method detection limit) |
| E | The analyte result is above the calibrated range. |
| GT | Greater Than |
| IB | Instrument Blank |
| ICV | Initial Calibration Verification |
| J | The quantitation is an estimation. |
| LCS(D) | Laboratory Control Spike (Duplicate) |
| LLQC/LLIQC | Low Level Quantitation Check |
| 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 |
| MB | Method Blank |
| MS(D) | Matrix Spike (Duplicate) |
| ND | Indicates the analyte is not detected. |
| RPD | Relative Percent Difference |
| TNTC | Too Numerous To Count |
| 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.

Print Date: 09/09/2020 1:17:18PM

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## Sample Summary

| Client Sample ID | Lab Sample ID | Collected | Received | Matrix |
|---|---|---|---|---|
| T1-19A | 1204021001 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-19B | 1204021002 | 08/06/2020 | 08/06/2020 | Solid/Soil (Wet Weight) |
| T1-21A | 1204021003 | 08/06/2020 | 08/06/2020 | Solid/Soil (Wet Weight) |
| T1-21B | 1204021004 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-29A | 1204021005 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-29B | 1204021006 | 08/06/2020 | 08/06/2020 | Solid/Soil (Wet Weight) |
| T1-31A | 1204021007 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-31B | 1204021008 | 08/06/2020 | 08/06/2020 | Solid/Soil (Wet Weight) |
| T1-33A | 1204021009 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-X | 1204021010 | 08/06/2020 | 08/06/2020 | Solid/Soil (Wet Weight) |
| T1-33B | 1204021011 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-35A | 1204021012 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-35B | 1204021013 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-37A | 1204021014 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| T1-37B | 1204021015 | 08/06/2020 | 08/06/2020 | Solid/Soil (Wet Weight) |
| T1-Y | 1204021016 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |
| Trip Blank | 1204021017 | 08/06/2020 | 08/06/2020 | Soil/Solid (dry weight) |

| Method | Method Description |
|---|---|
| AK101 | AK101/8021 Combo. (S) |
| SW8021B | AK101/8021 Combo. (S) |
| AK102 | Diesel/Residual Range Organics |
| AK103 | Diesel/Residual Range Organics |
| SM21 2540G | Percent Solids SM2540G |
| SW9060A-Mod | Total Organic Carbon-M in Soil |



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## Detectable Results Summary

Client Sample ID: **T1-19A**
Lab Sample ID: 1204021001

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 682 | mg/kg |
| | Residual Range Organics | 7680 | mg/kg |
| **Waters Department** | Total Organic Carbon | 37.7 | % |

Client Sample ID: **T1-21B**
Lab Sample ID: 1204021004

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 591 | mg/kg |
| | Residual Range Organics | 7630 | mg/kg |
| **Waters Department** | Total Organic Carbon | 36.3 | % |

Client Sample ID: **T1-29A**
Lab Sample ID: 1204021005

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 597 | mg/kg |
| | Residual Range Organics | 6910 | mg/kg |
| **Waters Department** | Total Organic Carbon | 38.4 | % |

Client Sample ID: **T1-31A**
Lab Sample ID: 1204021007

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 1080 | mg/kg |
| | Residual Range Organics | 15700 | mg/kg |
| **Volatile Fuels** | Gasoline Range Organics | 32.5J | mg/Kg |
| **Waters Department** | Total Organic Carbon | 36.4 | % |

Client Sample ID: **T1-33A**
Lab Sample ID: 1204021009

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 1170 | mg/kg |
| | Residual Range Organics | 13300 | mg/kg |
| **Volatile Fuels** | Gasoline Range Organics | 20.5J | mg/Kg |
| **Waters Department** | Total Organic Carbon | 33.2 | % |

Client Sample ID: **T1-35A**
Lab Sample ID: 1204021012

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 603 | mg/kg |
| | Residual Range Organics | 7150 | mg/kg |
| **Waters Department** | Total Organic Carbon | 36.9 | % |

Client Sample ID: **T1-37A**
Lab Sample ID: 1204021014

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 583 | mg/kg |
| | Residual Range Organics | 7330 | mg/kg |
| **Waters Department** | Total Organic Carbon | 32.1 | % |

Client Sample ID: **T1-Y**
Lab Sample ID: 1204021016

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 690 | mg/kg |
| | Residual Range Organics | 8090 | mg/kg |
| **Waters Department** | Total Organic Carbon | 37.2 | % |



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Results of **T1-19A**

Client Sample ID: **T1-19A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021001
Lab Project ID: 1204021

Collection Date: 08/06/20 14:55
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.2
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 682 | | 140 | 43.2 | mg/kg | 1 | | 08/25/20 01:50 |
| **Surrogates** | | | | | | | | |
| 5a Androstane (surr) | 96 | | 50-150 | | % | 1 | | 08/25/20 01:50 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 01:50
Container ID: 1204021001-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.208 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 7680 | | 698 | 300 | mg/kg | 1 | | 08/25/20 01:50 |
| **Surrogates** | | | | | | | | |
| n-Triacontane-d62 (surr) | 94.3 | | 50-150 | | % | 1 | | 08/25/20 01:50 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 01:50
Container ID: 1204021001-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.208 g
Prep Extract Vol: 5 mL



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Results of **T1-19A**

Client Sample ID: **T1-19A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021001
Lab Project ID: 1204021

Collection Date: 08/06/20 14:55
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.2
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 40.9 U | 81.8 | 24.5 | mg/Kg | 1 | | 08/11/20 19:57 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 93.8 | 50-150 | | % | 1 | | 08/11/20 19:57 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 19:57
Container ID: 1204021001-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 14:55
Prep Initial Wt./Vol.: 16.979 g
Prep Extract Vol: 39.5617 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 205 U | 409 | 131 | ug/kg | 1 | | 08/11/20 19:57 |
| Ethylbenzene | 409 U | 818 | 255 | ug/kg | 1 | | 08/11/20 19:57 |
| o-Xylene | 409 U | 818 | 255 | ug/kg | 1 | | 08/11/20 19:57 |
| P & M -Xylene | 820 U | 1640 | 491 | ug/kg | 1 | | 08/11/20 19:57 |
| Toluene | 409 U | 818 | 255 | ug/kg | 1 | | 08/11/20 19:57 |
| Xylenes (total) | 1225 U | 2450 | 746 | ug/kg | 1 | | 08/11/20 19:57 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.4 | 72-119 | | % | 1 | | 08/11/20 19:57 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 19:57
Container ID: 1204021001-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 14:55
Prep Initial Wt./Vol.: 16.979 g
Prep Extract Vol: 39.5617 mL



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Results of **T1-19A**

Client Sample ID: **T1-19A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021001
Lab Project ID: 1204021

Collection Date: 08/06/20 14:55
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.2
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 37.7 | 1.41 | 0.422 | % | 1 | | 08/15/20 11:38 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 11:38
Container ID: 1204021001-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 124.8 mg
Prep Extract Vol: 1 mL

Print Date: 09/09/2020 1:17:21PM

J flagging is activated

Results of **T1-21B**

Client Sample ID: **T1-21B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021004
Lab Project ID: 1204021

Collection Date: 08/06/20 12:45
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):13.9
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 591 | 143 | 44.4 | mg/kg | 1 | | 08/25/20 02:00 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 99.9 | 50-150 | | % | 1 | | 08/25/20 02:00 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 02:00
Container ID: 1204021004-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.156 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 7630 | 715 | 308 | mg/kg | 1 | | 08/25/20 02:00 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 95.5 | 50-150 | | % | 1 | | 08/25/20 02:00 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 02:00
Container ID: 1204021004-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.156 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2020 1:17:21PM

J flagging is activated

Results of **T1-21B**

Client Sample ID: **T1-21B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021004
Lab Project ID: 1204021

Collection Date: 08/06/20 12:45
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):13.9
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 36.6 U | 73.3 | 22.0 | mg/Kg | 1 | | 08/11/20 20:15 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 98.3 | 50-150 | | % | 1 | | 08/11/20 20:15 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 20:15
Container ID: 1204021004-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 12:45
Prep Initial Wt./Vol.: 21.215 g
Prep Extract Vol: 43.265 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 184 U | 367 | 117 | ug/kg | 1 | | 08/11/20 20:15 |
| Ethylbenzene | 367 U | 733 | 229 | ug/kg | 1 | | 08/11/20 20:15 |
| o-Xylene | 367 U | 733 | 229 | ug/kg | 1 | | 08/11/20 20:15 |
| P & M -Xylene | 735 U | 1470 | 440 | ug/kg | 1 | | 08/11/20 20:15 |
| Toluene | 367 U | 733 | 229 | ug/kg | 1 | | 08/11/20 20:15 |
| Xylenes (total) | 1100 U | 2200 | 669 | ug/kg | 1 | | 08/11/20 20:15 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 96 | 72-119 | | % | 1 | | 08/11/20 20:15 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 20:15
Container ID: 1204021004-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 12:45
Prep Initial Wt./Vol.: 21.215 g
Prep Extract Vol: 43.265 mL

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Results of **T1-21B**

Client Sample ID: **T1-21B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021004
Lab Project ID: 1204021

Collection Date: 08/06/20 12:45
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):13.9
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 36.3 | 1.60 | 0.480 | % | 1 | | 08/15/20 11:47 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 11:47
Container ID: 1204021004-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 112.4 mg
Prep Extract Vol: 1 mL

Print Date: 09/09/2020 1:17:21PM

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Results of **T1-29A**

Client Sample ID: **T1-29A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021005
Lab Project ID: 1204021

Collection Date: 08/06/20 14:00
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.4
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 597 | 139 | 43.0 | mg/kg | 1 | | 08/25/20 02:10 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 96.7 | 50-150 | | % | 1 | | 08/25/20 02:10 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 02:10
Container ID: 1204021005-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.103 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 6910 | 694 | 298 | mg/kg | 1 | | 08/25/20 02:10 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 100 | 50-150 | | % | 1 | | 08/25/20 02:10 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 02:10
Container ID: 1204021005-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.103 g
Prep Extract Vol: 5 mL

## Results of **T1-29A**

| | |
|---|---|
| Client Sample ID: **T1-29A** | Collection Date: 08/06/20 14:00 |
| Client Project ID: **20-2176 CRW Postmark Bog V2** | Received Date: 08/06/20 17:24 |
| Lab Sample ID: 1204021005 | Matrix: Soil/Solid (dry weight) |
| Lab Project ID: 1204021 | Solids (%):14.4 |
| | Location: |

## Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 33.0 U | 65.9 | 19.8 | mg/Kg | 1 | | 08/11/20 20:33 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 95.4 | 50-150 | | % | 1 | | 08/11/20 20:33 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 20:33
Container ID: 1204021005-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 14:00
Prep Initial Wt./Vol.: 24.117 g
Prep Extract Vol: 45.6537 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 165 U | 330 | 105 | ug/kg | 1 | | 08/11/20 20:33 |
| Ethylbenzene | 330 U | 659 | 206 | ug/kg | 1 | | 08/11/20 20:33 |
| o-Xylene | 330 U | 659 | 206 | ug/kg | 1 | | 08/11/20 20:33 |
| P & M -Xylene | 660 U | 1320 | 395 | ug/kg | 1 | | 08/11/20 20:33 |
| Toluene | 330 U | 659 | 206 | ug/kg | 1 | | 08/11/20 20:33 |
| Xylenes (total) | 990 U | 1980 | 601 | ug/kg | 1 | | 08/11/20 20:33 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.6 | 72-119 | | % | 1 | | 08/11/20 20:33 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 20:33
Container ID: 1204021005-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 14:00
Prep Initial Wt./Vol.: 24.117 g
Prep Extract Vol: 45.6537 mL

Print Date: 09/09/2020 1:17:21PM

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Results of **T1-29A**

Client Sample ID: **T1-29A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021005
Lab Project ID: 1204021

Collection Date: 08/06/20 14:00
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.4
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 38.4 | 1.57 | 0.470 | % | 1 | | 08/15/20 11:57 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 11:57
Container ID: 1204021005-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 111.2 mg
Prep Extract Vol: 1 mL

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## Results of **T1-31A**

Client Sample ID: **T1-31A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021007
Lab Project ID: 1204021

Collection Date: 08/06/20 10:35
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):17.4
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1080 | 114 | 35.4 | mg/kg | 1 | | 08/25/20 02:20 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 103 | 50-150 | | % | 1 | | 08/25/20 02:20 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 02:20
Container ID: 1204021007-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.249 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 15700 | 570 | 245 | mg/kg | 1 | | 08/25/20 02:20 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 88.8 | 50-150 | | % | 1 | | 08/25/20 02:20 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 02:20
Container ID: 1204021007-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.249 g
Prep Extract Vol: 5 mL



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## Results of **T1-31A**

Client Sample ID: **T1-31A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021007
Lab Project ID: 1204021

Collection Date: 08/06/20 10:35
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):17.4
Location:

## Results by **Volatile Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 32.5 | J | 95.5 | 28.6 | mg/Kg | 1 | | 08/11/20 20:51 |
| **Surrogates** | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 151 | * | 50-150 | | % | 1 | | 08/11/20 20:51 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 20:51
Container ID: 1204021007-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 10:35
Prep Initial Wt./Vol.: 20.044 g
Prep Extract Vol: 66.5577 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | 239 | U | 477 | 153 | ug/kg | 1 | | 08/11/20 20:51 |
| Ethylbenzene | 478 | U | 955 | 298 | ug/kg | 1 | | 08/11/20 20:51 |
| o-Xylene | 478 | U | 955 | 298 | ug/kg | 1 | | 08/11/20 20:51 |
| P & M -Xylene | 955 | U | 1910 | 573 | ug/kg | 1 | | 08/11/20 20:51 |
| Toluene | 478 | U | 955 | 298 | ug/kg | 1 | | 08/11/20 20:51 |
| Xylenes (total) | 1430 | U | 2860 | 871 | ug/kg | 1 | | 08/11/20 20:51 |
| **Surrogates** | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 95.2 | | 72-119 | | % | 1 | | 08/11/20 20:51 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 20:51
Container ID: 1204021007-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 10:35
Prep Initial Wt./Vol.: 20.044 g
Prep Extract Vol: 66.5577 mL



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Results of **T1-31A**

Client Sample ID: **T1-31A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021007
Lab Project ID: 1204021

Collection Date: 08/06/20 10:35
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):17.4
Location:

Results by **Waters Department**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 36.4 | | 1.54 | 0.462 | % | 1 | | 08/15/20 12:08 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 12:08
Container ID: 1204021007-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 93.4 mg
Prep Extract Vol: 1 mL



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Results of **T1-33A**

Client Sample ID: **T1-33A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021009
Lab Project ID: 1204021

Collection Date: 08/06/20 09:15
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):27.3
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1170 | 73.1 | 22.7 | mg/kg | 1 | | 08/25/20 02:30 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 96.1 | 50-150 | | % | 1 | | 08/25/20 02:30 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 02:30
Container ID: 1204021009-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.077 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 13300 | 365 | 157 | mg/kg | 1 | | 08/25/20 02:30 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 80.2 | 50-150 | | % | 1 | | 08/25/20 02:30 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 02:30
Container ID: 1204021009-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.077 g
Prep Extract Vol: 5 mL




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## Results of **T1-33A**

Client Sample ID: **T1-33A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021009
Lab Project ID: 1204021

Collection Date: 08/06/20 09:15
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):27.3
Location:

### Results by **Volatile Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 20.5 | J | 44.4 | 13.3 | mg/Kg | 1 | | 08/11/20 21:09 |
| **Surrogates** | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 187 | * | 50-150 | | % | 1 | | 08/11/20 21:09 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 21:09
Container ID: 1204021009-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 09:15
Prep Initial Wt./Vol.: 29.443 g
Prep Extract Vol: 71.4044 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | 111 | U | 222 | 71.1 | ug/kg | 1 | | 08/11/20 21:09 |
| Ethylbenzene | 222 | U | 444 | 139 | ug/kg | 1 | | 08/11/20 21:09 |
| o-Xylene | 222 | U | 444 | 139 | ug/kg | 1 | | 08/11/20 21:09 |
| P & M -Xylene | 444 | U | 888 | 266 | ug/kg | 1 | | 08/11/20 21:09 |
| Toluene | 222 | U | 444 | 139 | ug/kg | 1 | | 08/11/20 21:09 |
| Xylenes (total) | 665 | U | 1330 | 405 | ug/kg | 1 | | 08/11/20 21:09 |
| **Surrogates** | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.9 | | 72-119 | | % | 1 | | 08/11/20 21:09 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 21:09
Container ID: 1204021009-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 09:15
Prep Initial Wt./Vol.: 29.443 g
Prep Extract Vol: 71.4044 mL



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Results of **T1-33A**

Client Sample ID: **T1-33A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021009
Lab Project ID: 1204021

Collection Date: 08/06/20 09:15
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):27.3
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 33.2 | 1.04 | 0.313 | % | 1 | | 08/15/20 12:18 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 12:18
Container ID: 1204021009-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 87.9 mg
Prep Extract Vol: 1 mL

Print Date: 09/09/2020 1:17:21PM

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Results of **T1-35A**

Client Sample ID: **T1-35A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021012
Lab Project ID: 1204021

Collection Date: 08/06/20 11:40
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):23.9
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 603 | 83.6 | 25.9 | mg/kg | 1 | | 08/25/20 02:40 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 81.1 | 50-150 | | % | 1 | | 08/25/20 02:40 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 02:40
Container ID: 1204021012-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.082 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 7150 | 418 | 180 | mg/kg | 1 | | 08/25/20 02:40 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 80.2 | 50-150 | | % | 1 | | 08/25/20 02:40 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 02:40
Container ID: 1204021012-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.082 g
Prep Extract Vol: 5 mL



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## Results of **T1-35A**

Client Sample ID: **T1-35A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021012
Lab Project ID: 1204021

Collection Date: 08/06/20 11:40
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):23.9
Location:

## Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 57.0 U | 114 | 34.1 | mg/Kg | 1 | | 08/11/20 21:27 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 130 | 50-150 | | % | 1 | | 08/11/20 21:27 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 21:27
Container ID: 1204021012-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 11:40
Prep Initial Wt./Vol.: 10.735 g
Prep Extract Vol: 58.1738 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 284 U | 568 | 182 | ug/kg | 1 | | 08/11/20 21:27 |
| Ethylbenzene | 570 U | 1140 | 354 | ug/kg | 1 | | 08/11/20 21:27 |
| o-Xylene | 570 U | 1140 | 354 | ug/kg | 1 | | 08/11/20 21:27 |
| P & M -Xylene | 1135 U | 2270 | 681 | ug/kg | 1 | | 08/11/20 21:27 |
| Toluene | 570 U | 1140 | 354 | ug/kg | 1 | | 08/11/20 21:27 |
| Xylenes (total) | 1705 U | 3410 | 1040 | ug/kg | 1 | | 08/11/20 21:27 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.7 | 72-119 | | % | 1 | | 08/11/20 21:27 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 21:27
Container ID: 1204021012-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 11:40
Prep Initial Wt./Vol.: 10.735 g
Prep Extract Vol: 58.1738 mL



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Results of **T1-35A**

Client Sample ID: **T1-35A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021012
Lab Project ID: 1204021

Collection Date: 08/06/20 11:40
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):23.9
Location:

Results by **Waters Department**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 36.9 | | 1.06 | 0.319 | % | 1 | | 08/15/20 12:26 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 12:26
Container ID: 1204021012-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 98.4 mg
Prep Extract Vol: 1 mL

Print Date: 09/09/2020 1:17:21PM

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Results of **T1-37A**

Client Sample ID: **T1-37A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021014
Lab Project ID: 1204021

Collection Date: 08/06/20 13:20
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):26.1
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 583 | | 76.0 | 23.6 | mg/kg | 1 | | 08/25/20 02:51 |
| **Surrogates** | | | | | | | | |
| 5a Androstane (surr) | 91.5 | | 50-150 | | % | 1 | | 08/25/20 02:51 |

Analytical Batch: XFC15707
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/25/20 02:51
Container ID: 1204021014-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.257 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 7330 | | 380 | 164 | mg/kg | 1 | | 08/25/20 02:51 |
| **Surrogates** | | | | | | | | |
| n-Triacontane-d62 (surr) | 76.7 | | 50-150 | | % | 1 | | 08/25/20 02:51 |

Analytical Batch: XFC15707
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/25/20 02:51
Container ID: 1204021014-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.257 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2020 1:17:21PM

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## Results of **T1-37A**

Client Sample ID: **T1-37A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021014
Lab Project ID: 1204021

Collection Date: 08/06/20 13:20
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):26.1
Location:

## Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 37.1 U | 74.3 | 22.3 | mg/Kg | 1 | | 08/11/20 21:46 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 139 | 50-150 | | % | 1 | | 08/11/20 21:46 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 21:46
Container ID: 1204021014-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 13:20
Prep Initial Wt./Vol.: 15.954 g
Prep Extract Vol: 61.7938 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 186 U | 371 | 119 | ug/kg | 1 | | 08/11/20 21:46 |
| Ethylbenzene | 372 U | 743 | 232 | ug/kg | 1 | | 08/11/20 21:46 |
| o-Xylene | 372 U | 743 | 232 | ug/kg | 1 | | 08/11/20 21:46 |
| P & M -Xylene | 745 U | 1490 | 446 | ug/kg | 1 | | 08/11/20 21:46 |
| Toluene | 372 U | 743 | 232 | ug/kg | 1 | | 08/11/20 21:46 |
| Xylenes (total) | 1115 U | 2230 | 677 | ug/kg | 1 | | 08/11/20 21:46 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 96.3 | 72-119 | | % | 1 | | 08/11/20 21:46 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 21:46
Container ID: 1204021014-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 13:20
Prep Initial Wt./Vol.: 15.954 g
Prep Extract Vol: 61.7938 mL



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Results of **T1-37A**

Client Sample ID: **T1-37A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021014
Lab Project ID: 1204021

Collection Date: 08/06/20 13:20
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):26.1
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 32.1 | 1.89 | 0.566 | % | 1 | | 08/15/20 12:36 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 12:36
Container ID: 1204021014-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 50.8 mg
Prep Extract Vol: 1 mL

Print Date: 09/09/2020 1:17:21PM

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Results of **T1-Y**

Client Sample ID: **T1-Y**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021016
Lab Project ID: 1204021

Collection Date: 08/06/20 15:00
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.3
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 690 | 138 | 42.7 | mg/kg | 1 | | 08/31/20 09:06 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 80.6 | 50-150 | | % | 1 | | 08/31/20 09:06 |

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 09:06
Container ID: 1204021016-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.402 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 8090 | 689 | 296 | mg/kg | 1 | | 08/31/20 09:06 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 77.3 | 50-150 | | % | 1 | | 08/31/20 09:06 |

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 09:06
Container ID: 1204021016-A

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 08/18/20 07:30
Prep Initial Wt./Vol.: 30.402 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2020 1:17:21PM

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Results of **T1-Y**

Client Sample ID: **T1-Y**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021016
Lab Project ID: 1204021

Collection Date: 08/06/20 15:00
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.3
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyze |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 23.8 U | 47.5 | 14.2 | mg/Kg | 1 | | 08/11/20 22:04 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 86 | 50-150 | | % | 1 | | 08/11/20 22:04 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 22:04
Container ID: 1204021016-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 15:00
Prep Initial Wt./Vol.: 49.804 g
Prep Extract Vol: 67.6753 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 119 U | 237 | 75.9 | ug/kg | 1 | | 08/11/20 22:04 |
| Ethylbenzene | 238 U | 475 | 148 | ug/kg | 1 | | 08/11/20 22:04 |
| o-Xylene | 238 U | 475 | 148 | ug/kg | 1 | | 08/11/20 22:04 |
| P & M -Xylene | 475 U | 949 | 285 | ug/kg | 1 | | 08/11/20 22:04 |
| Toluene | 238 U | 475 | 148 | ug/kg | 1 | | 08/11/20 22:04 |
| Xylenes (total) | 710 U | 1420 | 433 | ug/kg | 1 | | 08/11/20 22:04 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.2 | 72-119 | | % | 1 | | 08/11/20 22:04 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 22:04
Container ID: 1204021016-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 15:00
Prep Initial Wt./Vol.: 49.804 g
Prep Extract Vol: 67.6753 mL

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Results of **T1-Y**

Client Sample ID: **T1-Y**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021016
Lab Project ID: 1204021

Collection Date: 08/06/20 15:00
Received Date: 08/06/20 17:24
Matrix: Soil/Solid (dry weight)
Solids (%):14.3
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 37.2 | 3.61 | 1.08 | % | 1 | | 08/15/20 13:10 |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 13:10
Container ID: 1204021016-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 48.4 mg
Prep Extract Vol: 1 mL



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## Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204021017
Lab Project ID: 1204021

Collection Date: 08/06/20 09:15
Received Date: 08/06/20 17:24
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 | 4.39 U | 8.79 | 2.64 | mg/Kg | 1 | | 08/11/20 22:22 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 115 | 50-150 | | % | 1 | | 08/11/20 22:22 |

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 22:22
Container ID: 1204021017-A

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 09:15
Prep Initial Wt./Vol.: 14.223 g
Prep Extract Vol: 25 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 21.9 U | 43.9 | 14.1 | ug/kg | 1 | | 08/11/20 22:22 |
| Ethylbenzene | 44.0 U | 87.9 | 27.4 | ug/kg | 1 | | 08/11/20 22:22 |
| o-Xylene | 44.0 U | 87.9 | 27.4 | ug/kg | 1 | | 08/11/20 22:22 |
| P & M -Xylene | 88.0 U | 176 | 52.7 | ug/kg | 1 | | 08/11/20 22:22 |
| Toluene | 44.0 U | 87.9 | 27.4 | ug/kg | 1 | | 08/11/20 22:22 |
| Xylenes (total) | 132 U | 264 | 80.2 | ug/kg | 1 | | 08/11/20 22:22 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.6 | 72-119 | | % | 1 | | 08/11/20 22:22 |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 22:22
Container ID: 1204021017-A

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/06/20 09:15
Prep Initial Wt./Vol.: 14.223 g
Prep Extract Vol: 25 mL



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**Method Blank**

Blank ID: MB for HBN 1810423 [SPT/11106]

Matrix: Soil/Solid (dry weight)

Blank Lab ID: 1575293

QC for Samples:

1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

Results by **SM21 2540G**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Solids | 100 | | | % |

Analytical Batch: SPT11106
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M
Analytical Date/Time: 8/17/2020 5:18:00PM

## Duplicate Sample Summary

Original Sample ID: 1204181008
Duplicate Sample ID: 1575294

Analysis Date: 08/17/2020 17:18
Matrix: Soil/Solid (dry weight)

QC for Samples:

1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### Results by **SM21 2540G**

| NAME | Original | Duplicate | Units | RPD (%) | RPD CL |
|---|---|---|---|---|---|
| Total Solids | 83.9 | 84.0 | % | 0.12 | (< 15 ) |

Analytical Batch: SPT11106
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M



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## Method Blank

Blank ID: MB for HBN 1810178 [VXX/36101]
Blank Lab ID: 1574160

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016, 1204021017

## Results by **AK101**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Gasoline Range Organics | 1.25U | 2.50 | 0.750 | mg/Kg |
| **Surrogates** | | | | |
| 4-Bromofluorobenzene (surr) | 87 | 50-150 | | % |

Analytical Batch: VFC15277
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/11/2020 5:51:00PM

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 8/11/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204021 [VXX36101]
Blank Spike Lab ID: 1574161
Date Analyzed: 08/11/2020 16:39

Spike Duplicate ID: LCSD for HBN 1204021 [VXX36101]
Spike Duplicate Lab ID: 1574162
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016, 1204021017

## 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 | 12.5 | 13.3 | 107 | 12.5 | 13.5 | 108 | ( 60-120 ) | 1.10 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 1.25 | 90.3 | 90 | 1.25 | 92 | 92 | ( 50-150 ) | 1.90 | |

Analytical Batch: **VFC15277**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36101**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2020 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL



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## Method Blank

Blank ID: MB for HBN 1810178 [VXX/36101]
Blank Lab ID: 1574160

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016, 1204021017

### Results by **SW8021B**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Benzene | 6.25U | 12.5 | 4.00 | ug/kg |
| Ethylbenzene | 12.5U | 25.0 | 7.80 | ug/kg |
| o-Xylene | 12.5U | 25.0 | 7.80 | ug/kg |
| P & M -Xylene | 25.0U | 50.0 | 15.0 | ug/kg |
| Toluene | 12.5U | 25.0 | 7.80 | ug/kg |
| Xylenes (total) | 37.5U | 75.0 | 22.8 | ug/kg |
| **Surrogates** | | | | |
| 1,4-Difluorobenzene (surr) | 98.4 | 72-119 | | % |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/11/2020 5:51:00PM

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 8/11/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 09/09/2020 1:17:33PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204021 [VXX36101]
Blank Spike Lab ID: 1574163
Date Analyzed: 08/11/2020 17:15

Spike Duplicate ID: LCSD for HBN 1204021 [VXX36101]
Spike Duplicate Lab ID: 1574164
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016, 1204021017

### Results by **SW8021B**

| | Blank Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 1250 | 1360 | 109 | 1250 | 1340 | 107 | ( 75-125 ) | 2.20 | (< 20 ) |
| Ethylbenzene | 1250 | 1140 | 91 | 1250 | 1130 | 91 | ( 75-125 ) | 0.57 | (< 20 ) |
| o-Xylene | 1250 | 1160 | 93 | 1250 | 1140 | 91 | ( 75-125 ) | 1.40 | (< 20 ) |
| P & M -Xylene | 2500 | 2280 | 91 | 2500 | 2260 | 90 | ( 80-125 ) | 1.00 | (< 20 ) |
| Toluene | 1250 | 1190 | 96 | 1250 | 1200 | 96 | ( 70-125 ) | 0.65 | (< 20 ) |
| Xylenes (total) | 3750 | 3440 | 92 | 3750 | 3400 | 91 | ( 78-124 ) | 1.10 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 1250 | 104 | 104 | 1250 | 103 | 103 | ( 72-119 ) | 0.23 | |

Analytical Batch: **VFC15277**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36101**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2020 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL

## Matrix Spike Summary

Original Sample ID: 1204053004
MS Sample ID: 1574165 MS
MSD Sample ID: 1574166 MSD

Analysis Date: 08/11/2020 18:27
Analysis Date: 08/11/2020 18:45
Analysis Date: 08/11/2020 19:03
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016, 1204021017

### Results by **SW8021B**

| | | Matrix Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 7.25J | 772 | 843 | 108 | 772 | 848 | 109 | 75-125 | 0.66 | (< 20 ) |
| Ethylbenzene | 24.6 | 772 | 765 | 96 | 772 | 777 | 98 | 75-125 | 1.60 | (< 20 ) |
| o-Xylene | 47.9 | 772 | 762 | 92 | 772 | 766 | 93 | 75-125 | 0.61 | (< 20 ) |
| P & M -Xylene | 163 | 1546 | 1609 | 94 | 1546 | 1630 | 95 | 80-125 | 1.30 | (< 20 ) |
| Toluene | 115 | 772 | 863 | 97 | 772 | 887 | 100 | 70-125 | 2.70 | (< 20 ) |
| Xylenes (total) | 211 | 2320 | 2372 | 93 | 2320 | 2393 | 94 | 78-124 | 1.10 | (< 20 ) |
| **Surrogates** | | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | | 772 | 773 | 100 | 772 | 770 | 100 | 72-119 | 0.32 | |

Analytical Batch: VFC15277
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/11/2020 6:45:00PM

Prep Batch: VXX36101
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/11/2020 6:00:00AM
Prep Initial Wt./Vol.: 84.54g
Prep Extract Vol: 25.00mL



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## Method Blank

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574906

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### Results by **SW9060A-Mod**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 11:06:25AM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL



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## Method Blank

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574911

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

## Results by **SW9060A-Mod**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 2:44:42PM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204021 [WXX13402]
Blank Spike Lab ID: 1574907
Date Analyzed: 08/15/2020 11:19

Spike Duplicate ID: LCSD for HBN 1204021 [WXX13402]
Spike Duplicate Lab ID: 1574908
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### Results by **SW9060A-Mod**

| | Blank Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 3.35 | 3.23 | 96 | 3.35 | 3.22 | 96 | ( 75-125 ) | 0.31 | (< 25 ) |

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204021 [WXX13402]
Blank Spike Lab ID: 1574912
Date Analyzed: 08/15/2020 14:59

Spike Duplicate ID: LCSD for HBN 1204021 [WXX13402]
Spike Duplicate Lab ID: 1574913
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### Results by **SW9060A-Mod**

| | Blank Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 3.35 | 3.21 | 96 | 3.35 | 3.18 | 95 | ( 75-125 ) | 0.94 | (< 25 ) |

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL



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## Matrix Spike Summary

Original Sample ID: 1204021014
MS Sample ID: 1574909 MS
MSD Sample ID:

Analysis Date: 08/15/2020 12:36
Analysis Date: 08/15/2020 12:43
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 32.1 | 7.20 | 41.0 | 123 | | | | 75-125 | | |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 12:43:57PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 53.10mg
Prep Extract Vol: 1.00mL



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## Matrix Spike Summary

Original Sample ID: 1204046001
MS Sample ID: 1574910 MS
MSD Sample ID:

Analysis Date: 08/15/2020 13:17
Analysis Date: 08/15/2020 13:26
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021016

Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 33.8 | 4.98 | 40.5 | 130 * | | | | 75-125 | | |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 1:26:17PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 71.80mg
Prep Extract Vol: 1.00mL

## Method Blank

Blank ID: MB for HBN 1810422 [XXX/43674]
Blank Lab ID: 1575290

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### Results by **AK102**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Diesel Range Organics | 10.0U | 20.0 | 6.20 | mg/kg |
| **Surrogates** | | | | |
| 5a Androstane (surr) | 98.9 | 60-120 | | % |

Analytical Batch: XFC15707
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/24/2020 11:59:00PM

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 8/18/2020 7:30:24AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204021 [XXX43674]
Blank Spike Lab ID: 1575291
Date Analyzed: 08/25/2020 00:09

Spike Duplicate ID: LCSD for HBN 1204021 [XXX43674]
Spike Duplicate Lab ID: 1575292
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

### 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 | 833 | 632 | 76 | 833 | 636 | 76 | ( 75-125 ) | 0.72 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 5a Androstane (surr) | 16.7 | 98.5 | 99 | 16.7 | 99.7 | 100 | ( 60-120 ) | 1.10 | |

Analytical Batch: **XFC15707**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43674**
Prep Method: **SW3550C**
Prep Date/Time: **08/18/2020 07:30**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL



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## Method Blank

Blank ID: MB for HBN 1810422 [XXX/43674]
Blank Lab ID: 1575290

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

## Results by **AK103**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Residual Range Organics | 50.0U | 100 | 43.0 | mg/kg |
| **Surrogates** | | | | |
| n-Triacontane-d62 (surr) | 113 | 60-120 | | % |

Analytical Batch: XFC15707
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/24/2020 11:59:00PM

Prep Batch: XXX43674
Prep Method: SW3550C
Prep Date/Time: 8/18/2020 7:30:24AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204021 [XXX43674]
Blank Spike Lab ID: 1575291
Date Analyzed: 08/25/2020 00:09

Spike Duplicate ID: LCSD for HBN 1204021 [XXX43674]
Spike Duplicate Lab ID: 1575292
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204021001, 1204021004, 1204021005, 1204021007, 1204021009, 1204021012, 1204021014, 1204021016

## Results by **AK103**

| | Blank Spike (mg/kg) | | | Spike Duplicate (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Residual Range Organics | 833 | 637 | 76 | 833 | 641 | 77 | ( 60-120 ) | 0.60 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| n-Triacontane-d62 (surr) | 16.7 | 99.3 | 99 | 16.7 | 106 | 106 | ( 60-120 ) | 6.60 | |

Analytical Batch: **XFC15707**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43674**
Prep Method: **SW3550C**
Prep Date/Time: **08/18/2020 07:30**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL



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**CHAIN OF CUSTODY RECORD**

**1204021**

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**Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.**

Page 1 of 2

Section 1

CLIENT: RSE

CONTACT: Kyle Wiseman | PHONE #: 278-1023

PROJECT NAME: CRW Postmark Bog V2 | PROJECT/PWSID/PERMIT#: 20-2176

REPORTS TO: RSE | E-MAIL: kwiseman@restorsci.com | Profile #: 364091 GM

INVOICE TO: RSE | QUOTE #: | P.O. #:

Section 3 — Preservative: None, None, None, MeOH

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 2

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | PFAS | DRO/RRO | TOC | GRO/BTEX | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1AC | T1-19A | 8/6/2020 | 14:55 | SOIL | 3 | G | X | X | X | X | |
| 2A | T1-19B | 8/6/2020 | 15:15 | SOIL | 1 | G | X | | | | |
| 3AC | T1-21A | 8/6/2020 | 12:35 | SOIL | 3 | G | X | X | X | X | HOLD DRO, RRO, TOC GRO, BTEX |
| 4AC | T1-21B | 8/6/2020 | 12:45 | SOIL | 3 | G | X | X | X | X | |
| 5AC | T1-29A | 8/6/2020 | 14:00 | SOIL | 3 | G | X | X | X | X | |
| 6A | T1-29B | 8/6/2020 | 14:20 | SOIL | 1 | G | X | | | | |
| 7AC | T1-31A | 8/6/2020 | 10:35 | SOIL | 3 | G | X | X | X | X | |
| 8AC | T1-31B | 8/6/2020 | 11:00 | SOIL | 3 | G | X | X | X | X | HOLD DRO, RRO, TOC BTEX, GRO |
| 9AC | T1-33A | 8/6/2020 | 9:15 | SOIL | 3 | G | X | X | X | X | |
| 10A | T1-X | 8/6/2020 | 14:57 | SOIL | 1 | G | X | | | | |

Section 5

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) [signature] | 8/6/2020 | 17:24 | |
| (2) | | | |
| (3) | | | |
| (4) | 8/6/20 | 1724 | Received For Laboratory By: [signature] |

Section 4 — DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID: ____

Requested Turnaround Time and/or Special Instructions: SINGLE TOC PER DAVID N. -CIR

Temp Blank °C: 11.4 D50

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery[ ] Commerical Delivery [ ]

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B-84

F083-Blank_COC_20181228

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CHAIN OF CUSTODY RECORD

1204021

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Page 2 of 2

Section 1

CLIENT: RSE

CONTACT: Kyle Wiseman | PHONE #: 278-1623

PROJECT NAME: CRW Postmark Bog V2 | PROJECT/PWSID/PERMIT#: 20-2176

REPORTS TO: RSE | E-MAIL: kwiseman@restorsci.com

Profile #:

INVOICE TO: RSE | QUOTE #:

P.O. #:

Section 3 — Preservative

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 2

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/ MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | PFAS | DRO/RRO | TOC | GRO/BTEX | | | | | | | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11AC | T1-33B | 8/6/2020 | 9:45 | SOIL | 3 | G | X | X | X | X | | | | | | | HOLD DRO/RRO, TOC GRO, BTEX |
| 12AC | T1-35A | 8/6/2020 | 11:40 | SOIL | 3 | G | X | X | X | X | | | | | | | |
| 13AC | T1-35B | 8/6/2020 | 11:50 | SOIL | 3 | G | X | X | X | X | | | | | | | HOLD DRO, RRO, TOC GRO, BTEX |
| 14AC | T1-37A | 8/6/2020 | 13:20 | SOIL | 3 | G | X | X | X | X | | | | | | | |
| 15AC | T1-37B | 8/6/2020 | 13:35 | SOIL | 3 | G | X | X | X | X | | | | | | | HOLD DRO, RRO, TOC GRO, BTEX |
| 16AB | T1-Y | 8/6/2020 | 15:00 | SOIL | 2 | G | | X | X | X | | | | | | | |
| 17A | | | | | | | | | | | | | | | | | |

Section 5

| Relinquished By: (1) | Date 8/6/2020 | Time 17:24 | Received By: |
|---|---|---|---|
| Relinquished By: (2) | Date | Time | Received By: |
| Relinquished By: (3) | Date | Time | Received By: |
| Relinquished By: (4) | Date 8/6/20 | Time 1721 | Received For Laboratory By: |

Section 4 — DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 11.4 D50

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [✓] Commerical Delivery [ ]

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B-85

F083-Blank_COC_20181228

e-Sample Receipt Form

**SGS Workorder #:** **1204021**

1 2 0 4 0 2 1

| Review Criteria | Condition (Yes, No, N/A) | Exceptions Noted below |
|---|---|---|
| **Chain of Custody / Temperature Requirements** | | Yes Exemption permitted if sampler hand carries/delivers. |
| Were Custody Seals intact? Note # & location | N/A | absent |
| COC accompanied samples? | Yes | |
| DOD: Were samples received in COC corresponding coolers? | N/A | |
| | Yes | **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required |
| Temperature blank compliant* (i.e., 0-6 °C after CF)? | No | Cooler ID: 1 @ 11.4 °C Therm. ID: D50 |
| | | Cooler ID: @ °C Therm. ID: |
| If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available. | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| **If >6°C, were samples collected <8 hours ago?* | Yes | |
| If <0°C, were sample containers ice free? | N/A | |
| Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed. | | |

| Review Criteria | Condition (Yes, No, N/A) | Exceptions Noted below |
|---|---|---|
| **Holding Time / Documentation / Sample Condition Requirements** | | Note: Refer to form F-083 "Sample Guide" for specific holding times. |
| Were samples received within holding time? | Yes | |
| Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information | Yes | |
| Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals) | Yes | |
| | | N/A ***Exemption permitted for metals (e.g,200.8/6020A). |
| Were proper containers (type/mass/volume/preservative***)used? | Yes | |
| **Volatile / LL-Hg Requirements** | | |
| Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? | Yes | |
| Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? | N/A | |
| Were all soil VOAs field extracted with MeOH+BFB? | Yes | |

**Note to Client:** Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

F102b_SRFpm_20190325

## Sample Containers and Preservatives

| Container Id | Preservative | Container Condition | Container Id | Preservative | Container Condition |
|---|---|---|---|---|---|
| 1204021001-A | No Preservative Required | OK | | | |
| 1204021001-B | Methanol field pres. 4 C | OK | | | |
| 1204021001-C | No Preservative Required | OK | | | |
| 1204021002-A | No Preservative Required | OK | | | |
| 1204021003-A | No Preservative Required | OK | | | |
| 1204021003-B | Methanol field pres. 4 C | OK | | | |
| 1204021003-C | No Preservative Required | OK | | | |
| 1204021004-A | No Preservative Required | OK | | | |
| 1204021004-B | Methanol field pres. 4 C | OK | | | |
| 1204021004-C | No Preservative Required | OK | | | |
| 1204021005-A | No Preservative Required | OK | | | |
| 1204021005-B | Methanol field pres. 4 C | OK | | | |
| 1204021005-C | No Preservative Required | OK | | | |
| 1204021006-A | No Preservative Required | OK | | | |
| 1204021007-A | No Preservative Required | OK | | | |
| 1204021007-B | 2x Methanol field pres. 4 C | OK | | | |
| 1204021007-C | No Preservative Required | OK | | | |
| 1204021008-A | No Preservative Required | OK | | | |
| 1204021008-B | Methanol field pres. 4 C | OK | | | |
| 1204021008-C | No Preservative Required | OK | | | |
| 1204021009-A | No Preservative Required | OK | | | |
| 1204021009-B | 2x Methanol field pres. 4 C | OK | | | |
| 1204021009-C | No Preservative Required | OK | | | |
| 1204021010-A | No Preservative Required | OK | | | |
| 1204021011-A | No Preservative Required | OK | | | |
| 1204021011-B | Methanol field pres. 4 C | OK | | | |
| 1204021011-C | No Preservative Required | OK | | | |
| 1204021012-A | No Preservative Required | OK | | | |
| 1204021012-B | 2x Methanol field pres. 4 C | OK | | | |
| 1204021012-C | No Preservative Required | OK | | | |
| 1204021013-A | No Preservative Required | OK | | | |
| 1204021013-B | Methanol field pres. 4 C | OK | | | |
| 1204021013-C | No Preservative Required | OK | | | |
| 1204021014-A | No Preservative Required | OK | | | |
| 1204021014-B | 2x Methanol field pres. 4 C | OK | | | |
| 1204021014-C | No Preservative Required | OK | | | |
| 1204021015-A | No Preservative Required | OK | | | |
| 1204021015-B | Methanol field pres. 4 C | OK | | | |
| 1204021015-C | No Preservative Required | OK | | | |
| 1204021016-A | No Preservative Required | OK | | | |
| 1204021016-B | Methanol field pres. 4 C | OK | | | |
| 1204021017-A | Methanol field pres. 4 C | OK | | | |

| Container Id | Preservative | Container Condition | Container Id | Preservative | Container Condition |
|---|---|---|---|---|---|

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.

e-Hardcopy 2.0
*Automated Report*

# Technical Report for

The results set forth herein are provided by SGS North America Inc.

SGS North America, Inc

1204021

SGS Job Number: FA77717

Sampling Date: 08/06/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report:

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

# Table of Contents

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# Sample Summary

SGS North America, Inc

1204021

**Job No:** FA77717

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| FA77717-1 | 08/06/20 | 14:55 | | 08/12/20 | SO | Soil | T1-19A |
| FA77717-2 | 08/06/20 | 15:15 | | 08/12/20 | SO | Soil | T1-19B |
| FA77717-3 | 08/06/20 | 12:35 | | 08/12/20 | SO | Soil | T1-21A |
| FA77717-4 | 08/06/20 | 12:45 | | 08/12/20 | SO | Soil | T1-21B |
| FA77717-5 | 08/06/20 | 14:00 | | 08/12/20 | SO | Soil | T1-29A |
| FA77717-6 | 08/06/20 | 14:20 | | 08/12/20 | SO | Soil | T1-29B |
| FA77717-7 | 08/06/20 | 10:35 | | 08/12/20 | SO | Soil | T1-31A |
| FA77717-8 | 08/06/20 | 11:00 | | 08/12/20 | SO | Soil | T1-31B |
| FA77717-9 | 08/06/20 | 09:15 | | 08/12/20 | SO | Soil | T1-33A |
| FA77717-10 | 08/06/20 | 14:57 | | 08/12/20 | SO | Soil | T1-X |
| FA77717-11 | 08/06/20 | 09:45 | | 08/12/20 | SO | Soil | T1-33B |
| FA77717-12 | 08/06/20 | 11:40 | | 08/12/20 | SO | Soil | T1-35A |
| FA77717-13 | 08/06/20 | 11:50 | | 08/12/20 | SO | Soil | T1-35B |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

# Sample Summary

(continued)

SGS North America, Inc

1204021

**Job No:** FA77717

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| FA77717-14 | 08/06/20 | 13:20 | | 08/12/20 | SO | Soil | T1-37A |
| FA77717-15 | 08/06/20 | 13:35 | | 08/12/20 | SO | Soil | T1-37B |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SGS North America Inc.

# Sample Summary
(continued)

SGS North America, Inc

1204021

**Job No:** FA77717

| Sample Number | Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|
| FA77717-14 | 08/06/20 | 13:20 | 08/12/20 | SO | Soil | |
| FA77717-15 | 08/06/20 | 13:35 | 08/12/20 | SO | Soil | |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** SGS North America, Inc **Job No:** FA77717

**Site:** 1204021 **Report Date** 8/28/2020 2:12:56

15 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 08/06/2020 and were received at SGS North America Inc - Orlando on 08/12/2020 properly preserved, at 1.4 Deg. C and intact. These Samples received an SGS Orlando job number of FA77717. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Please note, samples were high in moisture and organic material. The matrix resulted in low recoveries for many of the mass labelled isotopes. This was confirmed by the MS and MSD. The laboratory performed an additional extraction step; however, this showed little improvement. The target analyte recoveries in the MS/MSD did yield acceptable recoveries due to recovery correction from the mass labelled isotopes.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81701

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA77717-15MS, FA77717-15MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Matrix Spike Duplicate Recovery(s) for Perfluorooctanesulfonic acid are outside control limits. Probable cause is due to matrix interference.

Sample(s) FA77717-1, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9 have surrogates outside control limits.

FA77717-1 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1: Confirmation run for ID Standard Recoveries.

FA77717-1 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-1 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-2: Confirmation run for ID Standard Recoveries.

FA77717-2 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-3 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-3: Confirmation run for ID Standard Recoveries.

FA77717-3 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-3 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-3 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-3 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-4: Confirmation run for ID Standard Recoveries.
FA77717-4 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5: Confirmation run for ID Standard Recoveries.
FA77717-5 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-5 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C3-PFBS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C5-PFPeA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-6 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-6: Confirmation run for ID Standard Recoveries.
FA77717-7 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7: Confirmation run for ID Standard Recoveries.
FA77717-7 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-7 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C3-PFBS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8: Confirmation run for ID Standard Recoveries.
FA77717-8 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-8 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for Perfluorotridecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C4-PFBA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9: Confirmation run for ID Standard Recoveries.
FA77717-9 for Perfluorodecanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-9 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluoropentanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluoropentanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorooctanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorohexanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorononanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorohexanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluoroheptanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluoroheptanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C5-PFPeA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorodecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for PFOSA: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluoroundecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorobutanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorobutanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for EtFOSAA: Associated ID Standard outside control limits due to matrix interference. Confirmed by

FA77717-9 for 8:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 6:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 4:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorononanesulfonic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorooctanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for Perfluorododecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C3-PFBS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-9 for MeFOSAA: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-10 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-10: Confirmation run for ID Standard Recoveries.

FA77717-10 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-10 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-10 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-10 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-10 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-11 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-11 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-11 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C5-PFPeA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-11: Confirmation run for ID Standard Recoveries.
FA77717-11 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C3-PFBS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C5-PFPeA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12: Confirmation run for ID Standard Recoveries.
FA77717-12 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-12 for 13C4-PFBA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13: Confirmation run for ID Standard Recoveries.
FA77717-13 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C3-PFBS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C4-PFBA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C5-PFPeA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-13 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA77717-13 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14: Confirmation run for ID Standard Recoveries.
FA77717-14 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C3-PFHxS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C5-PFPeA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-14 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis.
FA77717-15 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C6-PFDA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C8-FOSA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C8-PFOA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C8-PFOS: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C9-PFNA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for d3-MeFOSAA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15: Confirmation run for ID Standard Recoveries.
FA77717-15 for 13C2-4:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C2-6:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C2-8:2FTS: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C2-PFDoDA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C4-PFHpA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C5-PFHxA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.
FA77717-15 for 13C7-PFUnDA: Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.

## General Chemistry By Method SM19 2540G

**Matrix:** SO **Batch ID:** GN85928

Sample(s) FA77700-1DUP were used as the QC samples for Solids, Percent.

**Matrix:** SO **Batch ID:** GN85933

Sample(s) FA77717-1DUP were used as the QC samples for Solids, Percent.

RPD(s) for Duplicate for Solids, Percent are outside control limits for sample GN85933-D1. Probable cause is due to sample non-homogeneity.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

______________________________________

Ariel Hartney, Client Services *(Signature on file)*

# Summary of Hits



**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| Lab Sample ID / Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| **FA77717-1** | **T1-19A** | | | | | |
| Perfluorobutanoic acid | | 0.0030 J | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0120 | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0173 | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0079 | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0019 J | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0035 J | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0034 J | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0153 | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0312 | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0226 | 0.0068 | 0.0034 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-2** | **T1-19B** | | | | | |
| Perfluorobutanoic acid | | 0.0076 J | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0247 | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0326 | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0158 | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0052 J | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanoic acid | | 0.0025 J | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0066 J | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0075 J | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0385 | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.154 | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0384 | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| 8:2 Fluorotelomer sulfonate | | 0.0022 J | 0.0085 | 0.0043 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-3** | **T1-21A** | | | | | |
| Perfluorobutanoic acid | | 0.0048 J | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0174 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0220 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0125 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0043 J | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanoic acid | | 0.0015 J | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0050 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0055 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0347 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0790 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0298 | 0.0050 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-4** | **T1-21B** | | | | | |
| Perfluoropentanoic acid | | 0.0068 J | 0.0074 | 0.0037 | mg/kg | EPA 537M QSM5.3 B-15 |

# Summary of Hits

**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| Lab Sample ID Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| Perfluorohexanoic acid | | 0.0071 J | 0.0074 | 0.0037 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0026 J | 0.0074 | 0.0037 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0060 J | 0.0074 | 0.0037 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0157 | 0.0074 | 0.0037 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0050 J | 0.0074 | 0.0037 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-5** | **T1-29A** | | | | | |
| Perfluorobutanoic acid | | 0.0053 J | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0177 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0275 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0112 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0042 J | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0063 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0066 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0294 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0847 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0237 | 0.0055 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-6** | **T1-29B** | | | | | |
| Perfluorobutanoic acid | | 0.0091 J | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0279 | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0379 | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0156 | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0051 J | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0094 J | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0084 J | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0341 | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.111 | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0106 J | 0.011 | 0.0056 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-7** | **T1-31A** | | | | | |
| Perfluorobutanoic acid | | 0.0015 J | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0050 | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0072 | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0051 | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0013 J | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0014 J | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0080 | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0256 | 0.0049 | 0.0025 | mg/kg | EPA 537M QSM5.3 B-15 |

# Summary of Hits



**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| Lab Sample ID / Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| **FA77717-8** | **T1-31B** | | | | | |
| Perfluoropentanoic acid | | 0.0031 J | 0.0051 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0034 J | 0.0051 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0022 J | 0.0051 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0044 J | 0.0051 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0090 | 0.0051 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0028 J | 0.0051 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-9** | **T1-33A** | | | | | |
| Perfluoropentanoic acid [a] | | 0.0010 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid [a] | | 0.0014 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid [a] | | 0.0012 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid [a] | | 0.0021 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | | 0.0025 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-10** | **T1-X** | | | | | |
| Perfluorobutanoic acid | | 0.0051 J | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0181 | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0267 | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0135 | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0043 J | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0053 J | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0056 J | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0317 | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0909 | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0389 | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| 8:2 Fluorotelomer sulfonate | | 0.0019 J | 0.0066 | 0.0033 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-11** | **T1-33B** | | | | | |
| Perfluoropentanoic acid | | 0.0014 J | 0.0061 | 0.0031 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0018 J | 0.0061 | 0.0031 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-12** | **T1-35A** | | | | | |
| Perfluoropentanoic acid | | 0.0012 J | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0016 J | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0025 J | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0029 J | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanoic acid | | 0.0022 J | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0102 | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0436 | 0.0039 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |

# Summary of Hits

**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| Lab Sample ID Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| **FA77717-13** | **T1-35B** | | | | | |
| Perfluorooctanesulfonic acid | | 0.0052 J | 0.0075 | 0.0038 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-14** | **T1-37A** | | | | | |
| Perfluorobutanoic acid | | 0.0020 J | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0063 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0196 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0109 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0075 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanoic acid | | 0.0028 J | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0011 J | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0032 J | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0327 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanesulfonic acid | | 0.0041 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.165 | 0.036 | 0.018 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0311 | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| 8:2 Fluorotelomer sulfonate | | 0.0018 J | 0.0036 | 0.0018 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77717-15** | **T1-37B** | | | | | |
| Perfluoropentanoic acid | | 0.0054 J | 0.0070 | 0.0035 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0150 | 0.0070 | 0.0035 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0042 J | 0.0070 | 0.0035 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0079 | 0.0070 | 0.0035 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0482 | 0.0070 | 0.0035 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0067 J | 0.0070 | 0.0035 | mg/kg | EPA 537M QSM5.3 B-15 |

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

4

Report of Analysis

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-19A | | |
| **Lab Sample ID:** | FA77717-1 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 14.6 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53202.D | 1 | 08/27/20 10:39 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53070.D | 1 | 08/25/20 15:27 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53071.D | 10 | 08/25/20 15:42 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.01 g | 1.0 ml |
| Run #2 | 2.01 g | 1.0 ml |
| Run #3 | 2.01 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0030 | 0.0068 | 0.0034 | 0.0017 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0120 | 0.0068 | 0.0034 | 0.0014 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0173 | 0.0068 | 0.0034 | 0.0014 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0079 | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0019 | 0.0068 | 0.0034 | 0.0017 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0035 | 0.0068 | 0.0034 | 0.0017 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0034 | 0.0068 | 0.0034 | 0.0017 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0153 | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0312 | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0068 U | 0.017 | 0.0068 | 0.0034 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0068 U | 0.017 | 0.0068 | 0.0034 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-19A | | |
| **Lab Sample ID:** | FA77717-1 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 14.6 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0226 | 0.0068 | 0.0034 | 0.0017 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0034 U | 0.0068 | 0.0034 | 0.0017 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 66% | 54% | 50% | 50-150% |
| | 13C5-PFPeA | 59% | 52% | 51% | 50-150% |
| | 13C5-PFHxA | 54% | 49% b | 50% | 50-150% |
| | 13C4-PFHpA | 49% b | 44% b | 48% b | 50-150% |
| | 13C8-PFOA | 49% b | 46% b | 52% | 50-150% |
| | 13C9-PFNA | 50% | 47% b | 52% | 50-150% |
| | 13C6-PFDA | 40% b | 40% b | 49% b | 50-150% |
| | 13C7-PFUnDA | 48% b | 46% b | 52% | 50-150% |
| | 13C2-PFDoDA | 44% b | 45% b | 53% | 50-150% |
| | 13C2-PFTeDA | 45% b | 46% b | 53% | 50-150% |
| | 13C3-PFBS | 60% | 50% | 52% | 50-150% |
| | 13C3-PFHxS | 56% | 53% | 57% | 50-150% |
| | 13C8-PFOS | 50% | 45% b | 54% | 50-150% |
| | 13C8-FOSA | 28% b | 32% b | 52% | 50-150% |
| | d3-MeFOSAA | 46% b | 49% b | 58% | 50-150% |
| | 13C2-4:2FTS | 51% | 45% b | 49% b | 50-150% |
| | 13C2-6:2FTS | 50% | 47% b | 54% | 50-150% |
| | 13C2-8:2FTS | 37% b | 38% b | 47% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-19B | | |
| **Lab Sample ID:** | FA77717-2 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 10.7 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53203.D | 1 | 08/27/20 11:00 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53072.D | 1 | 08/25/20 15:57 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53073.D | 10 | 08/25/20 16:11 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.19 g | 1.0 ml |
| Run #2 | 2.19 g | 1.0 ml |
| Run #3 | 2.19 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0076 | 0.0085 | 0.0043 | 0.0021 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0247 | 0.0085 | 0.0043 | 0.0017 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0326 | 0.0085 | 0.0043 | 0.0017 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0158 | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0052 | 0.0085 | 0.0043 | 0.0021 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0025 | 0.0085 | 0.0043 | 0.0021 | mg/kg | J |
| 335-76-2 | Perfluorodecanoic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0066 | 0.0085 | 0.0043 | 0.0021 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0075 | 0.0085 | 0.0043 | 0.0021 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0385 | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.154 | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0085 U | 0.021 | 0.0085 | 0.0043 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0085 U | 0.021 | 0.0085 | 0.0043 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-19B | | |
| **Lab Sample ID:** | FA77717-2 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 10.7 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0043 U | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0384 | 0.0085 | 0.0043 | 0.0021 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0022 | 0.0085 | 0.0043 | 0.0021 | mg/kg | J |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 60% | 45% b | 42% b | 50-150% |
| | 13C5-PFPeA | 53% | 44% b | 42% b | 50-150% |
| | 13C5-PFHxA | 48% b | 40% b | 42% b | 50-150% |
| | 13C4-PFHpA | 45% b | 37% b | 40% b | 50-150% |
| | 13C8-PFOA | 46% b | 40% b | 44% b | 50-150% |
| | 13C9-PFNA | 47% b | 41% b | 44% b | 50-150% |
| | 13C6-PFDA | 39% b | 35% b | 42% b | 50-150% |
| | 13C7-PFUnDA | 46% b | 40% b | 43% b | 50-150% |
| | 13C2-PFDoDA | 45% b | 42% b | 43% b | 50-150% |
| | 13C2-PFTeDA | 48% b | 41% b | 43% b | 50-150% |
| | 13C3-PFBS | 52% | 42% b | 44% b | 50-150% |
| | 13C3-PFHxS | 50% | 44% b | 46% b | 50-150% |
| | 13C8-PFOS | 45% b | 39% b | 44% b | 50-150% |
| | 13C8-FOSA | 25% b | 27% b | 38% b | 50-150% |
| | d3-MeFOSAA | 43% b | 43% b | 48% b | 50-150% |
| | 13C2-4:2FTS | 45% b | 37% b | 39% b | 50-150% |
| | 13C2-6:2FTS | 47% b | 41% b | 45% b | 50-150% |
| | 13C2-8:2FTS | 40% b | 33% b | 40% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-21A | | |
| **Lab Sample ID:** | FA77717-3 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 18.3 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53209.D | 1 | 08/27/20 12:29 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53113.D | 1 | 08/26/20 09:21 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53075.D | 10 | 08/25/20 16:41 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.20 g | 1.0 ml |
| Run #2 | 2.20 g | 1.0 ml |
| Run #3 | 2.20 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0048 | 0.0050 | 0.0025 | 0.0012 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0174 | 0.0050 | 0.0025 | 0.00099 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0220 | 0.0050 | 0.0025 | 0.00099 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0125 | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0043 | 0.0050 | 0.0025 | 0.0012 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0015 | 0.0050 | 0.0025 | 0.0012 | mg/kg | J |
| 335-76-2 | Perfluorodecanoic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0050 | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0055 | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0347 | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0790 | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0050 U | 0.012 | 0.0050 | 0.0025 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0050 U | 0.012 | 0.0050 | 0.0025 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



**Client Sample ID:** T1-21A
**Lab Sample ID:** FA77717-3 **Date Sampled:** 08/06/20
**Matrix:** SO - Soil **Date Received:** 08/12/20
**Method:** EPA 537M QSM5.3 B-15 IN HOUSE **Percent Solids:** 18.3
**Project:** 1204021

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0298 | 0.0050 | 0.0025 | 0.0012 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0025 U | 0.0050 | 0.0025 | 0.0012 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 62% | 51% | 45% b | 50-150% |
| | 13C5-PFPeA | 52% | 45% b | 45% b | 50-150% |
| | 13C5-PFHxA | 45% b | 39% b | 45% b | 50-150% |
| | 13C4-PFHpA | 42% b | 35% b | 42% b | 50-150% |
| | 13C8-PFOA | 43% b | 37% b | 46% b | 50-150% |
| | 13C9-PFNA | 44% b | 37% b | 49% b | 50-150% |
| | 13C6-PFDA | 37% b | 33% b | 44% b | 50-150% |
| | 13C7-PFUnDA | 43% b | 39% b | 46% b | 50-150% |
| | 13C2-PFDoDA | 40% b | 38% b | 46% b | 50-150% |
| | 13C2-PFTeDA | 44% b | 37% b | 48% b | 50-150% |
| | 13C3-PFBS | 50% | 43% b | 47% b | 50-150% |
| | 13C3-PFHxS | 49% b | 41% b | 53% | 50-150% |
| | 13C8-PFOS | 45% b | 37% b | 47% b | 50-150% |
| | 13C8-FOSA | 18% b | 17% b | 39% b | 50-150% |
| | d3-MeFOSAA | 36% b | 37% b | 51% | 50-150% |
| | 13C2-4:2FTS | 42% b | 37% b | 42% b | 50-150% |
| | 13C2-6:2FTS | 45% b | 40% b | 49% b | 50-150% |
| | 13C2-8:2FTS | 38% b | 31% b | 42% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-21B | | |
| **Lab Sample ID:** | FA77717-4 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 11.8 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53205.D | 1 | 08/27/20 11:30 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53076.D | 1 | 08/25/20 16:56 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53077.D | 10 | 08/25/20 17:10 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.29 g | 1.0 ml |
| Run #2 | 2.29 g | 1.0 ml |
| Run #3 | 2.29 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0068 | 0.0074 | 0.0037 | 0.0015 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0071 | 0.0074 | 0.0037 | 0.0015 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0026 | 0.0074 | 0.0037 | 0.0019 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0060 | 0.0074 | 0.0037 | 0.0019 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0157 | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0074 U | 0.019 | 0.0074 | 0.0037 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0074 U | 0.019 | 0.0074 | 0.0037 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-21B | | |
| **Lab Sample ID:** | FA77717-4 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 11.8 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0050 | 0.0074 | 0.0037 | 0.0019 | mg/kg | J |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0037 U | 0.0074 | 0.0037 | 0.0019 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 62% | 45% b | 41% b | 50-150% |
| | 13C5-PFPeA | 56% | 43% b | 43% b | 50-150% |
| | 13C5-PFHxA | 50% | 40% b | 41% b | 50-150% |
| | 13C4-PFHpA | 47% b | 36% b | 40% b | 50-150% |
| | 13C8-PFOA | 47% b | 38% b | 43% b | 50-150% |
| | 13C9-PFNA | 49% b | 39% b | 43% b | 50-150% |
| | 13C6-PFDA | 41% b | 33% b | 41% b | 50-150% |
| | 13C7-PFUnDA | 50% | 37% b | 41% b | 50-150% |
| | 13C2-PFDoDA | 49% b | 37% b | 41% b | 50-150% |
| | 13C2-PFTeDA | 39% b | 34% b | 39% b | 50-150% |
| | 13C3-PFBS | 56% | 42% b | 41% b | 50-150% |
| | 13C3-PFHxS | 54% | 43% b | 44% b | 50-150% |
| | 13C8-PFOS | 49% b | 38% b | 43% b | 50-150% |
| | 13C8-FOSA | 18% b | 22% b | 35% b | 50-150% |
| | d3-MeFOSAA | 39% b | 38% b | 44% b | 50-150% |
| | 13C2-4:2FTS | 49% b | 37% b | 39% b | 50-150% |
| | 13C2-6:2FTS | 47% b | 40% b | 44% b | 50-150% |
| | 13C2-8:2FTS | 43% b | 33% b | 39% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-29A | | |
| **Lab Sample ID:** | FA77717-5 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.2 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53206.D | 1 | 08/27/20 11:44 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53080.D | 1 | 08/25/20 17:55 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53081.D | 10 | 08/25/20 18:09 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.23 g | 1.0 ml |
| Run #2 | 2.23 g | 1.0 ml |
| Run #3 | 2.23 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0053 | 0.0055 | 0.0028 | 0.0014 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0177 | 0.0055 | 0.0028 | 0.0011 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0275 | 0.0055 | 0.0028 | 0.0011 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0112 | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0042 | 0.0055 | 0.0028 | 0.0014 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0063 | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0066 | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0294 | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0847 | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0055 U | 0.014 | 0.0055 | 0.0028 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0055 U | 0.014 | 0.0055 | 0.0028 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.5

4

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-29A | | |
| **Lab Sample ID:** | FA77717-5 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.2 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0237 | 0.0055 | 0.0028 | 0.0014 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0028 U | 0.0055 | 0.0028 | 0.0014 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 59% | 48% b | 43% b | 50-150% |
| | 13C5-PFPeA | 54% | 46% b | 44% b | 50-150% |
| | 13C5-PFHxA | 48% b | 43% b | 43% b | 50-150% |
| | 13C4-PFHpA | 44% b | 38% b | 41% b | 50-150% |
| | 13C8-PFOA | 45% b | 41% b | 45% b | 50-150% |
| | 13C9-PFNA | 46% b | 42% b | 46% b | 50-150% |
| | 13C6-PFDA | 38% b | 36% b | 44% b | 50-150% |
| | 13C7-PFUnDA | 45% b | 41% b | 45% b | 50-150% |
| | 13C2-PFDoDA | 43% b | 40% b | 44% b | 50-150% |
| | 13C2-PFTeDA | 42% b | 40% b | 42% b | 50-150% |
| | 13C3-PFBS | 53% | 45% b | 44% b | 50-150% |
| | 13C3-PFHxS | 50% | 47% b | 49% b | 50-150% |
| | 13C8-PFOS | 46% b | 39% b | 43% b | 50-150% |
| | 13C8-FOSA | 22% b | 25% b | 41% b | 50-150% |
| | d3-MeFOSAA | 37% b | 41% b | 54% | 50-150% |
| | 13C2-4:2FTS | 46% b | 40% b | 40% b | 50-150% |
| | 13C2-6:2FTS | 46% b | 43% b | 48% b | 50-150% |
| | 13C2-8:2FTS | 38% b | 34% b | 42% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-29B | | |
| **Lab Sample ID:** | FA77717-6 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 8.7 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53207.D | 1 | 08/27/20 11:59 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53082.D | 1 | 08/25/20 18:24 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53083.D | 10 | 08/25/20 18:39 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.06 g | 1.0 ml |
| Run #2 | 2.06 g | 1.0 ml |
| Run #3 | 2.06 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0091 | 0.011 | 0.0056 | 0.0028 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0279 | 0.011 | 0.0056 | 0.0022 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0379 | 0.011 | 0.0056 | 0.0022 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0156 | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0051 | 0.011 | 0.0056 | 0.0028 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0094 | 0.011 | 0.0056 | 0.0028 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0084 | 0.011 | 0.0056 | 0.0028 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0341 | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.111 | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.011 U | 0.028 | 0.011 | 0.0056 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.011 U | 0.028 | 0.011 | 0.0056 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected　LOD = Limit of Detection　J = Indicates an estimated value
LOQ = Limit of Quantitation　DL = Detection Limit　B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range　N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-29B | | |
| **Lab Sample ID:** | FA77717-6 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 8.7 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0106 | 0.011 | 0.0056 | 0.0028 | mg/kg | J |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0056 U | 0.011 | 0.0056 | 0.0028 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 52% | 36% b | 33% b | 50-150% |
| | 13C5-PFPeA | 48% b | 35% b | 34% b | 50-150% |
| | 13C5-PFHxA | 44% b | 33% b | 33% b | 50-150% |
| | 13C4-PFHpA | 41% b | 31% b | 32% b | 50-150% |
| | 13C8-PFOA | 40% b | 32% b | 34% b | 50-150% |
| | 13C9-PFNA | 42% b | 34% b | 35% b | 50-150% |
| | 13C6-PFDA | 33% b | 27% b | 33% b | 50-150% |
| | 13C7-PFUnDA | 40% b | 32% b | 33% b | 50-150% |
| | 13C2-PFDoDA | 39% b | 32% b | 34% b | 50-150% |
| | 13C2-PFTeDA | 43% b | 34% b | 32% b | 50-150% |
| | 13C3-PFBS | 48% b | 35% b | 32% b | 50-150% |
| | 13C3-PFHxS | 46% b | 37% b | 35% b | 50-150% |
| | 13C8-PFOS | 40% b | 32% b | 34% b | 50-150% |
| | 13C8-FOSA | 26% b | 26% b | 33% b | 50-150% |
| | d3-MeFOSAA | 36% b | 35% b | 41% b | 50-150% |
| | 13C2-4:2FTS | 42% b | 31% b | 31% b | 50-150% |
| | 13C2-6:2FTS | 40% b | 34% b | 34% b | 50-150% |
| | 13C2-8:2FTS | 34% b | 27% b | 33% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-31A | | |
| **Lab Sample ID:** | FA77717-7 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 17.3 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53208.D | 1 | 08/27/20 12:14 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53084.D | 1 | 08/25/20 18:54 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53085.D | 10 | 08/25/20 19:09 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.35 g | 1.0 ml |
| Run #2 | 2.35 g | 1.0 ml |
| Run #3 | 2.35 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0015 | 0.0049 | 0.0025 | 0.0012 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0050 | 0.0049 | 0.0025 | 0.00098 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0072 | 0.0049 | 0.0025 | 0.00098 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0051 | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0013 | 0.0049 | 0.0025 | 0.0012 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0014 | 0.0049 | 0.0025 | 0.0012 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0080 | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0256 | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0049 U | 0.012 | 0.0049 | 0.0025 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0049 U | 0.012 | 0.0049 | 0.0025 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-31A | | |
| **Lab Sample ID:** | FA77717-7 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 17.3 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0025 U | 0.0049 | 0.0025 | 0.0012 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 57% | 44% b | 41% b | 50-150% |
| | 13C5-PFPeA | 55% | 45% b | 42% b | 50-150% |
| | 13C5-PFHxA | 49% b | 43% b | 41% b | 50-150% |
| | 13C4-PFHpA | 43% b | 38% b | 40% b | 50-150% |
| | 13C8-PFOA | 42% b | 38% b | 43% b | 50-150% |
| | 13C9-PFNA | 38% b | 35% b | 42% b | 50-150% |
| | 13C6-PFDA | 35% b | 31% b | 39% b | 50-150% |
| | 13C7-PFUnDA | 40% b | 36% b | 42% b | 50-150% |
| | 13C2-PFDoDA | 39% b | 36% b | 42% b | 50-150% |
| | 13C2-PFTeDA | 45% b | 34% b | 43% b | 50-150% |
| | 13C3-PFBS | 56% | 45% b | 42% b | 50-150% |
| | 13C3-PFHxS | 50% | 44% b | 49% b | 50-150% |
| | 13C8-PFOS | 42% b | 35% b | 41% b | 50-150% |
| | 13C8-FOSA | 17% b | 20% b | 39% b | 50-150% |
| | d3-MeFOSAA | 35% b | 35% b | 48% b | 50-150% |
| | 13C2-4:2FTS | 48% b | 40% b | 39% b | 50-150% |
| | 13C2-6:2FTS | 44% b | 40% b | 44% b | 50-150% |
| | 13C2-8:2FTS | 41% b | 32% b | 39% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-31B | | |
| **Lab Sample ID:** | FA77717-8 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 18.3 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53204.D | 1 | 08/27/20 11:15 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53086.D | 1 | 08/25/20 19:23 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53087.D | 10 | 08/25/20 19:38 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.13 g | 1.0 ml |
| Run #2 | 2.13 g | 1.0 ml |
| Run #3 | 2.13 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0031 | 0.0051 | 0.0026 | 0.0010 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0034 | 0.0051 | 0.0026 | 0.0010 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0022 | 0.0051 | 0.0026 | 0.0013 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0044 | 0.0051 | 0.0026 | 0.0013 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0090 | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0051 U | 0.013 | 0.0051 | 0.0026 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0051 U | 0.013 | 0.0051 | 0.0026 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis



**Client Sample ID:** T1-31B
**Lab Sample ID:** FA77717-8 **Date Sampled:** 08/06/20
**Matrix:** SO - Soil **Date Received:** 08/12/20
**Method:** EPA 537M QSM5.3 B-15 IN HOUSE **Percent Solids:** 18.3
**Project:** 1204021

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0028 | 0.0051 | 0.0026 | 0.0013 | mg/kg | J |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0026 U | 0.0051 | 0.0026 | 0.0013 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 56% | 39% b | 36% b | 50-150% |
| | 13C5-PFPeA | 50% | 37% b | 37% b | 50-150% |
| | 13C5-PFHxA | 44% b | 35% b | 36% b | 50-150% |
| | 13C4-PFHpA | 40% b | 32% b | 35% b | 50-150% |
| | 13C8-PFOA | 40% b | 33% b | 38% b | 50-150% |
| | 13C9-PFNA | 40% b | 34% b | 38% b | 50-150% |
| | 13C6-PFDA | 34% b | 28% b | 35% b | 50-150% |
| | 13C7-PFUnDA | 41% b | 33% b | 38% b | 50-150% |
| | 13C2-PFDoDA | 38% b | 34% b | 38% b | 50-150% |
| | 13C2-PFTeDA | 45% b | 36% b | 38% b | 50-150% |
| | 13C3-PFBS | 49% b | 37% b | 36% b | 50-150% |
| | 13C3-PFHxS | 46% b | 39% b | 41% b | 50-150% |
| | 13C8-PFOS | 41% b | 33% b | 35% b | 50-150% |
| | 13C8-FOSA | 18% b | 21% b | 37% b | 50-150% |
| | d3-MeFOSAA | 39% b | 36% b | 45% b | 50-150% |
| | 13C2-4:2FTS | 42% b | 33% b | 34% b | 50-150% |
| | 13C2-6:2FTS | 43% b | 35% b | 39% b | 50-150% |
| | 13C2-8:2FTS | 37% b | 29% b | 36% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-33A | | |
| **Lab Sample ID:** | FA77717-9 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.5 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53088.D | 1 | 08/25/20 19:53 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #2 [a] | 2Q53210.D | 1 | 08/27/20 12:44 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #3 [a] | 2Q53089.D | 10 | 08/25/20 20:08 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.19 g | 1.0 ml |
| Run #2 | 2.19 g | 1.0 ml |
| Run #3 | 2.19 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid [b] | 0.0010 | 0.0042 | 0.0021 | 0.00085 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid [b] | 0.0014 | 0.0042 | 0.0021 | 0.00085 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid [b] | 0.0012 | 0.0042 | 0.0021 | 0.0011 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic aci [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid [b] | 0.0021 | 0.0042 | 0.0021 | 0.0011 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic aci [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid [b] | 0.0025 | 0.0042 | 0.0021 | 0.0011 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA [b] | 0.0042 U | 0.011 | 0.0042 | 0.0021 | mg/kg | |
| 2991-50-6 | EtFOSAA [b] | 0.0042 U | 0.011 | 0.0042 | 0.0021 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected   LOD = Limit of Detection   J = Indicates an estimated value
LOQ = Limit of Quantitation   DL = Detection Limit   B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range   N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-33A | | |
| **Lab Sample ID:** | FA77717-9 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.5 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [b] | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 43% [c] | 51% | 38% [c] | 50-150% |
| | 13C5-PFPeA | 42% [c] | 46% [c] | 39% [c] | 50-150% |
| | 13C5-PFHxA | 39% [c] | 38% [c] | 39% [c] | 50-150% |
| | 13C4-PFHpA | 34% [c] | 34% [c] | 38% [c] | 50-150% |
| | 13C8-PFOA | 35% [c] | 35% [c] | 41% [c] | 50-150% |
| | 13C9-PFNA | 35% [c] | 34% [c] | 41% [c] | 50-150% |
| | 13C6-PFDA | 30% [c] | 28% [c] | 37% [c] | 50-150% |
| | 13C7-PFUnDA | 33% [c] | 33% [c] | 40% [c] | 50-150% |
| | 13C2-PFDoDA | 35% [c] | 28% [c] | 41% [c] | 50-150% |
| | 13C2-PFTeDA | 36% [c] | 28% [c] | 42% [c] | 50-150% |
| | 13C3-PFBS | 42% [c] | 49% [c] | 41% [c] | 50-150% |
| | 13C3-PFHxS | 41% [c] | 40% [c] | 46% [c] | 50-150% |
| | 13C8-PFOS | 34% [c] | 38% [c] | 39% [c] | 50-150% |
| | 13C8-FOSA | 20% [c] | 15% [c] | 40% [c] | 50-150% |
| | d3-MeFOSAA | 34% [c] | 28% [c] | 49% [c] | 50-150% |
| | 13C2-4:2FTS | 37% [c] | 39% [c] | 37% [c] | 50-150% |
| | 13C2-6:2FTS | 38% [c] | 37% [c] | 42% [c] | 50-150% |
| | 13C2-8:2FTS | 31% [c] | 33% [c] | 38% [c] | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(c) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected   LOD = Limit of Detection   J = Indicates an estimated value
LOQ = Limit of Quantitation   DL = Detection Limit   B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range   N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-X | | |
| **Lab Sample ID:** | FA77717-10 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 14.8 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53211.D | 1 | 08/27/20 12:58 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53093.D | 1 | 08/25/20 21:07 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53094.D | 10 | 08/25/20 21:21 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.04 g | 1.0 ml |
| Run #2 | 2.04 g | 1.0 ml |
| Run #3 | 2.04 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0051 | 0.0066 | 0.0033 | 0.0017 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0181 | 0.0066 | 0.0033 | 0.0013 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0267 | 0.0066 | 0.0033 | 0.0013 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0135 | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0043 | 0.0066 | 0.0033 | 0.0017 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0053 | 0.0066 | 0.0033 | 0.0017 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0056 | 0.0066 | 0.0033 | 0.0017 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0317 | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0909 | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0066 U | 0.017 | 0.0066 | 0.0033 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0066 U | 0.017 | 0.0066 | 0.0033 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-X | | |
| **Lab Sample ID:** | FA77717-10 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 14.8 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0033 U | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0389 | 0.0066 | 0.0033 | 0.0017 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0019 | 0.0066 | 0.0033 | 0.0017 | mg/kg | J |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 71% | 53% | 48% b | 50-150% |
| | 13C5-PFPeA | 62% | 49% b | 48% b | 50-150% |
| | 13C5-PFHxA | 55% | 45% b | 47% b | 50-150% |
| | 13C4-PFHpA | 51% | 40% b | 46% b | 50-150% |
| | 13C8-PFOA | 52% | 43% b | 50% | 50-150% |
| | 13C9-PFNA | 54% | 45% b | 51% | 50-150% |
| | 13C6-PFDA | 43% b | 38% b | 48% b | 50-150% |
| | 13C7-PFUnDA | 55% | 44% b | 49% b | 50-150% |
| | 13C2-PFDoDA | 49% b | 44% b | 50% | 50-150% |
| | 13C2-PFTeDA | 50% | 39% b | 45% b | 50-150% |
| | 13C3-PFBS | 62% | 47% b | 47% b | 50-150% |
| | 13C3-PFHxS | 58% | 49% b | 52% | 50-150% |
| | 13C8-PFOS | 53% | 43% b | 49% b | 50-150% |
| | 13C8-FOSA | 20% b | 27% b | 42% b | 50-150% |
| | d3-MeFOSAA | 47% b | 48% b | 57% | 50-150% |
| | 13C2-4:2FTS | 52% | 41% b | 45% b | 50-150% |
| | 13C2-6:2FTS | 56% | 46% b | 52% | 50-150% |
| | 13C2-8:2FTS | 47% b | 38% b | 47% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-33B | | | |
| **Lab Sample ID:** | FA77717-11 | | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 16.3 |
| **Project:** | 1204021 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53214.D | 1 | 08/27/20 13:44 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53095.D | 1 | 08/25/20 21:36 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53096.D | 10 | 08/25/20 21:51 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.00 g | 1.0 ml |
| Run #2 | 2.00 g | 1.0 ml |
| Run #3 | 2.00 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0014 | 0.0061 | 0.0031 | 0.0012 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0012 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0018 | 0.0061 | 0.0031 | 0.0015 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0061 U | 0.015 | 0.0061 | 0.0031 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0061 U | 0.015 | 0.0061 | 0.0031 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected　LOD = Limit of Detection　J = Indicates an estimated value
LOQ = Limit of Quantitation　DL = Detection Limit　B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range　N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-33B | | |
| **Lab Sample ID:** | FA77717-11 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.3 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0031 U | 0.0061 | 0.0031 | 0.0015 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 53% | 40% b | 36% b | 50-150% |
| | 13C5-PFPeA | 49% b | 39% b | 38% b | 50-150% |
| | 13C5-PFHxA | 42% b | 36% b | 37% b | 50-150% |
| | 13C4-PFHpA | 39% b | 33% b | 35% b | 50-150% |
| | 13C8-PFOA | 38% b | 34% b | 38% b | 50-150% |
| | 13C9-PFNA | 37% b | 34% b | 38% b | 50-150% |
| | 13C6-PFDA | 28% b | 28% b | 36% b | 50-150% |
| | 13C7-PFUnDA | 32% b | 32% b | 38% b | 50-150% |
| | 13C2-PFDoDA | 26% b | 33% b | 38% b | 50-150% |
| | 13C2-PFTeDA | 28% b | 35% b | 36% b | 50-150% |
| | 13C3-PFBS | 51% | 39% b | 37% b | 50-150% |
| | 13C3-PFHxS | 47% b | 40% b | 39% b | 50-150% |
| | 13C8-PFOS | 38% b | 32% b | 37% b | 50-150% |
| | 13C8-FOSA | 19% b | 22% b | 39% b | 50-150% |
| | d3-MeFOSAA | 29% b | 33% b | 47% b | 50-150% |
| | 13C2-4:2FTS | 42% b | 34% b | 35% b | 50-150% |
| | 13C2-6:2FTS | 41% b | 36% b | 39% b | 50-150% |
| | 13C2-8:2FTS | 29% b | 29% b | 36% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.

(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value

LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-35A | | | |
| **Lab Sample ID:** | FA77717-12 | | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 24.9 |
| **Project:** | 1204021 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53215.D | 1 | 08/27/20 13:59 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53097.D | 1 | 08/25/20 22:06 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53098.D | 10 | 08/25/20 22:20 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.08 g | 1.0 ml |
| Run #2 | 2.08 g | 1.0 ml |
| Run #3 | 2.08 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0012 | 0.0039 | 0.0019 | 0.00077 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0016 | 0.0039 | 0.0019 | 0.00077 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0025 | 0.0039 | 0.0019 | 0.00097 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0029 | 0.0039 | 0.0019 | 0.00097 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0022 | 0.0039 | 0.0019 | 0.00097 | mg/kg | J |
| 335-76-2 | Perfluorodecanoic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0102 | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0436 | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0039 U | 0.0097 | 0.0039 | 0.0019 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0039 U | 0.0097 | 0.0039 | 0.0019 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-35A | | |
| **Lab Sample ID:** | FA77717-12 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 24.9 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0019 U | 0.0039 | 0.0019 | 0.00097 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | | | | 50-150% |
| | 13C5-PFPeA | | | | 50-150% |
| | 13C5-PFHxA | | | | 50-150% |
| | 13C4-PFHpA | | | | 50-150% |
| | 13C8-PFOA | | | | 50-150% |
| | 13C9-PFNA | | | | 50-150% |
| | 13C6-PFDA | | | | 50-150% |
| | 13C7-PFUnDA | | | | 50-150% |
| | 13C2-PFDoDA | | | | 50-150% |
| | 13C2-PFTeDA | | | | 50-150% |
| | 13C3-PFBS | | | | 50-150% |
| | 13C3-PFHxS | | | | 50-150% |
| | 13C8-PFOS | | | | 50-150% |
| | 13C8-FOSA | | | | 50-150% |
| | d3-MeFOSAA | | | | 50-150% |
| | 13C2-4:2FTS | | | | 50-150% |
| | 13C2-6:2FTS | | | | 50-150% |
| | 13C2-8:2FTS | | | | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-35B | | | |
| **Lab Sample ID:** | FA77717-13 | | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 12.4 |
| **Project:** | 1204021 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53216.D | 1 | 08/27/20 14:14 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53114.D | 1 | 08/26/20 09:35 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53100.D | 10 | 08/25/20 22:50 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.15 g | 1.0 ml |
| Run #2 | 2.15 g | 1.0 ml |
| Run #3 | 2.15 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0015 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0015 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0052 | 0.0075 | 0.0038 | 0.0019 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0075 U | 0.019 | 0.0075 | 0.0038 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0075 U | 0.019 | 0.0075 | 0.0038 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-35B | | |
| **Lab Sample ID:** | FA77717-13 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 12.4 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0038 U | 0.0075 | 0.0038 | 0.0019 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 44% b | 37% b | 33% b | 50-150% |
| | 13C5-PFPeA | 36% b | 32% b | 33% b | 50-150% |
| | 13C5-PFHxA | 30% b | 27% b | 32% b | 50-150% |
| | 13C4-PFHpA | 28% b | 23% b | 31% b | 50-150% |
| | 13C8-PFOA | 31% b | 26% b | 34% b | 50-150% |
| | 13C9-PFNA | 33% b | 27% b | 35% b | 50-150% |
| | 13C6-PFDA | 29% b | 25% b | 34% b | 50-150% |
| | 13C7-PFUnDA | 35% b | 30% b | 34% b | 50-150% |
| | 13C2-PFDoDA | 33% b | 32% b | 35% b | 50-150% |
| | 13C2-PFTeDA | 33% b | 32% b | 35% b | 50-150% |
| | 13C3-PFBS | 35% b | 31% b | 33% b | 50-150% |
| | 13C3-PFHxS | 35% b | 29% b | 40% b | 50-150% |
| | 13C8-PFOS | 34% b | 27% b | 35% b | 50-150% |
| | 13C8-FOSA | 19% b | 18% b | 33% b | 50-150% |
| | d3-MeFOSAA | 32% b | 32% b | 39% b | 50-150% |
| | 13C2-4:2FTS | 29% b | 26% b | 31% b | 50-150% |
| | 13C2-6:2FTS | 31% b | 27% b | 34% b | 50-150% |
| | 13C2-8:2FTS | 30% b | 25% b | 32% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-37A | | |
| **Lab Sample ID:** | FA77717-14 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 27.4 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53217.D | 1 | 08/27/20 14:28 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53101.D | 1 | 08/25/20 23:05 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 | 2Q53218.D | 10 | 08/27/20 14:43 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.01 g | 1.0 ml |
| Run #2 | 2.01 g | 1.0 ml |
| Run #3 | 2.01 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0020 | 0.0036 | 0.0018 | 0.00091 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0063 | 0.0036 | 0.0018 | 0.00073 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0196 | 0.0036 | 0.0018 | 0.00073 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0109 | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0075 | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0028 | 0.0036 | 0.0018 | 0.00091 | mg/kg | J |
| 335-76-2 | Perfluorodecanoic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0011 | 0.0036 | 0.0018 | 0.00091 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0032 | 0.0036 | 0.0018 | 0.00091 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0327 | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0041 | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.165 [b] | 0.036 | 0.018 | 0.0091 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0036 U | 0.0091 | 0.0036 | 0.0018 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0036 U | 0.0091 | 0.0036 | 0.0018 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-37A | | |
| **Lab Sample ID:** | FA77717-14 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 27.4 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0018 U | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0311 | 0.0036 | 0.0018 | 0.00091 | mg/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0018 | 0.0036 | 0.0018 | 0.00091 | mg/kg | J |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 52% | 41% c | 56% | 50-150% |
| | 13C5-PFPeA | 49% c | 39% c | 56% | 50-150% |
| | 13C5-PFHxA | 44% c | 37% c | 54% | 50-150% |
| | 13C4-PFHpA | 40% c | 32% c | 54% | 50-150% |
| | 13C8-PFOA | 41% c | 35% c | 54% | 50-150% |
| | 13C9-PFNA | 41% c | 35% c | 59% | 50-150% |
| | 13C6-PFDA | 32% c | 29% c | 50% | 50-150% |
| | 13C7-PFUnDA | 38% c | 34% c | 54% | 50-150% |
| | 13C2-PFDoDA | 31% c | 32% c | 55% | 50-150% |
| | 13C2-PFTeDA | 36% c | 33% c | 54% | 50-150% |
| | 13C3-PFBS | 51% | 39% c | 61% | 50-150% |
| | 13C3-PFHxS | 48% c | 40% c | 60% | 50-150% |
| | 13C8-PFOS | 42% c | 33% c | 60% | 50-150% |
| | 13C8-FOSA | 21% c | 23% c | 57% | 50-150% |
| | d3-MeFOSAA | 33% c | 33% c | 61% | 50-150% |
| | 13C2-4:2FTS | 42% c | 34% c | 53% | 50-150% |
| | 13C2-6:2FTS | 44% c | 38% c | 61% | 50-150% |
| | 13C2-8:2FTS | 33% c | 29% c | 48% c | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Result is from Run# 3
(c) Outside control limits due to matrix interference. Confirmed by reanalysis.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-37B | | |
| **Lab Sample ID:** | FA77717-15 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 13.5 |
| **Project:** | 1204021 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q53219.D | 1 | 08/27/20 14:58 | NAF | 08/24/20 07:30 | OP81701 | S2Q791 |
| Run #2 [a] | 2Q53107.D | 1 | 08/26/20 07:51 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |
| Run #3 [a] | 2Q53108.D | 10 | 08/26/20 08:06 | NAF | 08/24/20 07:30 | OP81701 | S2Q789 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.11 g | 1.0 ml |
| Run #2 | 2.11 g | 1.0 ml |
| Run #3 | 2.11 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0054 | 0.0070 | 0.0035 | 0.0014 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0150 | 0.0070 | 0.0035 | 0.0014 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0042 | 0.0070 | 0.0035 | 0.0018 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0079 | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0482 | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0070 U | 0.018 | 0.0070 | 0.0035 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0070 U | 0.018 | 0.0070 | 0.0035 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-37B | | |
| **Lab Sample ID:** | FA77717-15 | **Date Sampled:** | 08/06/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 13.5 |
| **Project:** | 1204021 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0067 | 0.0070 | 0.0035 | 0.0018 | mg/kg | J |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0035 U | 0.0070 | 0.0035 | 0.0018 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Run# 3 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 61% | 50% | 45% b | 50-150% |
| | 13C5-PFPeA | 55% | 44% b | 43% b | 50-150% |
| | 13C5-PFHxA | 49% b | 41% b | 43% b | 50-150% |
| | 13C4-PFHpA | 47% b | 37% b | 41% b | 50-150% |
| | 13C8-PFOA | 46% b | 38% b | 42% b | 50-150% |
| | 13C9-PFNA | 47% b | 38% b | 43% b | 50-150% |
| | 13C6-PFDA | 36% b | 32% b | 42% b | 50-150% |
| | 13C7-PFUnDA | 43% b | 39% b | 44% b | 50-150% |
| | 13C2-PFDoDA | 33% b | 38% b | 44% b | 50-150% |
| | 13C2-PFTeDA | 32% b | 39% b | 42% b | 50-150% |
| | 13C3-PFBS | 54% | 45% b | 45% b | 50-150% |
| | 13C3-PFHxS | 52% | 43% b | 46% b | 50-150% |
| | 13C8-PFOS | 48% b | 38% b | 44% b | 50-150% |
| | 13C8-FOSA | 22% b | 22% b | 41% b | 50-150% |
| | d3-MeFOSAA | 32% b | 39% b | 49% b | 50-150% |
| | 13C2-4:2FTS | 47% b | 40% b | 41% b | 50-150% |
| | 13C2-6:2FTS | 47% b | 41% b | 45% b | 50-150% |
| | 13C2-8:2FTS | 36% b | 32% b | 42% b | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Section 5

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA77717

**SGS North America Inc.**
**CHAIN OF CUSTODY RECORD**

1204021

Locations Nationwide
Alaska | Florida
New Jersey | Colorado
Texas | North Carolina
Virginia | Louisiana
www.us.sgs.com

| | | | |
|---|---|---|---|
| CLIENT: | SGS North America Inc. - Alaska Division | SGS Reference: | SGS Orlando, FL |
| CONTACT: Julie Shumway | PHONE NO: (907) 562-2343 | Additional Comments: All soils report out in dry weight unless | Page 1 of 2 |
| PROJECT NAME: 1204021 | PWSID#: NPDL#: | | |
| REPORTS TO: Julie Shumway | E-MAIL: Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com | | |
| INVOICE TO: SGS - Alaska | QUOTE #: P.O. #: 1204021 | | |

INITIAL ASSESSMENT AG
LABEL VERIFICATION AG

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HHMM | MATRIX/ MATRIX CODE | # CONTAINERS | TYPE C = COMP G = GRAB MI = Multi Incremental Soils (Preservative Used: NONE) | EPA 537 PFAS | | | | | MS | MSD | SGS lab # | Location ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | T1-19A | 08/06/2020 | 14:55:00 | SO | 1 | | X | | | | | | | 1204021001 | |
| 2 | T1-19B | 08/06/2020 | 15:15:00 | Solid | 1 | | X | | | | | | | 1204021002 | |
| 3 | T1-21A | 08/06/2020 | 12:35:00 | SO | 1 | | X | | | | | | | 1204021003 | |
| 4 | T1-21B | 08/06/2020 | 12:45:00 | SO | 1 | | X | | | | | | | 1204021004 | |
| 5 | T1-29A | 08/06/2020 | 14:00:00 | SO | 1 | | X | | | | | | | 1204021005 | |
| 6 | T1-29B | 08/06/2020 | 14:20:00 | Solid | 1 | | X | | | | | | | 1204021006 | |
| 7 | T1-31A | 08/06/2020 | 10:35:00 | SO | 1 | | X | | | | | | | 1204021007 | |
| 8 | T1-31B | 08/06/2020 | 11:00:00 | SO | 1 | | X | | | | | | | 1204021008 | |
| 9 | T1-33A | 08/06/2020 | 09:15:00 | SO | 1 | | X | | | | | | | 1204021009 | |
| 10 | T1-X | 08/06/2020 | 14:57:00 | Solid | 1 | | X | | | | | | | 1204021010 | |

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) J. Shumway | 8/11/20 | 0814 | Fedex |
| (2) Fedex | 8/12/20 | 945 | [signature] |
| (3) | | | |
| (4) | | | Received For Laboratory By: |

DOD Project? YES
Report to DL (J Flags)? YES
If J- Report as DL/LOD/LOQ.
Data Deliverable Requirements: Level 2
Cooler ID:
Requested Turnaround Time and-or Special Instructions:
Temp Blank °C: 1.4
or Ambient [ ]
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411

5.1
5

**FA77717: Chain of Custody**
**Page 1 of 3**

FA77717

**SGS North America Inc.**
**CHAIN OF CUSTODY RECORD**

1204021

Locations Nationwide

| | |
|---|---|
| Alaska | Florida |
| New Jersey | Colorado |
| Texas | North Carolina |
| Virginia | Louisiana |

www.us.sgs.com

| | |
|---|---|
| CLIENT: | SGS North America Inc. - Alaska Division |
| CONTACT: Julie Shumway | PHONE NO: (907) 562-2343 |
| PROJECT NAME: 1204021 | PWSID#: NPDL#: |
| REPORTS TO: Julie Shumway | E-MAIL: Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com |
| INVOICE TO: SGS - Alaska | QUOTE #: P.O. #: 1204021 |

SGS Reference:

Page 2 of 2

Additional Comments: All soils report out in dry weight unless

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HHMM | MATRIX/ MATRIX CODE | # CONTAINERS | Preservative Used: / TYPE C = COMP G = GRAB MI = Multi Incremental Soils | NONE EPA 537 PFAS | | | | MS | MSD | SGS lab # | Location ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | T1-33B | 08/06/2020 | 09:45:00 | SO | 1 | | X | | | | | | 1204021011 | |
| 12 | T1-35A | 08/06/2020 | 11:40:00 | SO | 1 | | X | | | | | | 1204021012 | |
| 13 | T1-35B | 08/06/2020 | 11:50:00 | SO | 1 | | X | | | | | | 1204021013 | |
| 14 | T1-37A | 08/06/2020 | 13:20:00 | SO | 1 | | X | | | | | | 1204021014 | |
| 15 | T1-37B | 08/06/2020 | 13:35:00 | SO | 1 | | X | | | | | | 1204021015 | |

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) J. Shumway | 8/11/20 | 0841 | Fedex |
| (2) Fedex | 8/12/20 | 945 | [illegible] |
| (3) | | | Received By: |
| (4) | | | Received For Laboratory By: |

DOD Project? YES

Report to DL (J Flags)? If J- Report as DL/LOD/LOQ. YES

Data Deliverable Requirements: Level 2

Cooler ID:

Requested Turnaround Time and-or Special Instructions:

Temp Blank °C: [illegible]

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301

[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411

**FA77717: Chain of Custody**
**Page 2 of 3**

5.1 5

# SGS Sample Receipt Summary

**Job Number:** FA77717 **Client:** SGS NORTH AMERICA, INC. - ALASKA DI **Project:** 1204021

**Date / Time Received:** 8/12/2020 9:45:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 148348008273

**Therm ID:** **Therm CF:** **# of Coolers:**

**Cooler Temps (Raw Measured) °C:**

**Cooler Temps (Corrected) °C:**

| Cooler Information | Y | N |
|---|---|---|
| 1. Custody Seals Present | ☑ | ☐ |
| 2. Custody Seals Intact | ☑ | ☐ |
| 3. Temp criteria achieved | ☐ | ☐ |
| 4. Cooler temp verification | N/A | |
| 5. Cooler media | N/A | |

| Trip Blank Information | Y | N | N/A |
|---|---|---|---|
| 1. Trip Blank present / cooler | ☐ | ☐ | ☑ |
| 2. Trip Blank listed on COC | ☐ | ☐ | ☑ |

| | W | S | N/A |
|---|---|---|---|
| 3. Type Of TB Received | ☐ | ☐ | ☑ |

| Sample Information | Y | N | N/A |
|---|---|---|---|
| 1. Sample labels present on bottles | ☑ | ☐ | |
| 2. Samples preserved properly | ☑ | ☐ | |
| 3. Sufficient volume/containers recvd for analysis: | ☑ | ☐ | |
| 4. Condition of sample | Intact | | |
| 5. Sample recvd within HT | ☑ | ☐ | |
| 6. Dates/Times/IDs on COC match Sample Label | ☑ | ☐ | |
| 7. VOCs have headspace | ☐ | ☐ | ☑ |
| 8. Bottles received for unspecified tests | ☐ | ☑ | |
| 9. Compositing instructions clear | ☐ | ☐ | ☑ |
| 10. Voa Soil Kits/Jars received past 48hrs? | ☐ | ☐ | ☑ |
| 11. % Solids Jar received? | ☐ | ☐ | ☑ |
| 12. Residual Chlorine Present? | ☐ | ☐ | ☑ |

**Misc. Information**

Number of Encores: 25-Gram ______ 5-Gram ______ Number of 5035 Field Kits: ______ Number of Lab Filtered Metals: ______

Test Strip Lot #s: pH 0-3 ______ pH 10-12 ______ Other: (Specify) ______ ______

Residual Chlorine Test Strip Lot #: ______

Comments

SM001
Rev. Date 05/24/17

Technician: BRYANG Date: 8/12/2020 9:45:00 AM Reviewer: ______ Date: ______

FA77717: Chain of Custody
Page 3 of 3

# QC Evaluation: DOD QSM5.x Limits

**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81701 | EPA 537M QSM5.3 B-15 | | | | | | |
| OP81701-BS | 375-22-4 | Perfluorobutanoic acid | BSP | REC | 102 | % | 71-135 |
| OP81701-BS | 2706-90-3 | Perfluoropentanoic acid | BSP | REC | 91 | % | 69-132 |
| OP81701-BS | 307-24-4 | Perfluorohexanoic acid | BSP | REC | 93 | % | 70-132 |
| OP81701-BS | 375-85-9 | Perfluoroheptanoic acid | BSP | REC | 99 | % | 71-131 |
| OP81701-BS | 335-67-1 | Perfluorooctanoic acid | BSP | REC | 102 | % | 69-133 |
| OP81701-BS | 375-95-1 | Perfluorononanoic acid | BSP | REC | 96 | % | 72-129 |
| OP81701-BS | 335-76-2 | Perfluorodecanoic acid | BSP | REC | 94 | % | 69-133 |
| OP81701-BS | 2058-94-8 | Perfluoroundecanoic acid | BSP | REC | 97 | % | 64-136 |
| OP81701-BS | 307-55-1 | Perfluorododecanoic acid | BSP | REC | 99 | % | 69-135 |
| OP81701-BS | 72629-94-8 | Perfluorotridecanoic acid | BSP | REC | 91 | % | 66-139 |
| OP81701-BS | 376-06-7 | Perfluorotetradecanoic acid | BSP | REC | 93 | % | 69-133 |
| OP81701-BS | 375-73-5 | Perfluorobutanesulfonic acid | BSP | REC | 101 | % | 72-128 |
| OP81701-BS | 2706-91-4 | Perfluoropentanesulfonic acid | BSP | REC | 98 | % | 73-123 |
| OP81701-BS | 355-46-4 | Perfluorohexanesulfonic acid | BSP | REC | 91 | % | 67-130 |
| OP81701-BS | 375-92-8 | Perfluoroheptanesulfonic acid | BSP | REC | 95 | % | 70-132 |
| OP81701-BS | 1763-23-1 | Perfluorooctanesulfonic acid | BSP | REC | 98 | % | 67-136 |
| OP81701-BS | 68259-12-1 | Perfluorononanesulfonic acid | BSP | REC | 100 | % | 69-125 |
| OP81701-BS | 335-77-3 | Perfluorodecanesulfonic acid | BSP | REC | 104 | % | 59-134 |
| OP81701-BS | 754-91-6 | PFOSA | BSP | REC | 100 | % | 67-137 |
| OP81701-BS | 2355-31-9 | MeFOSAA | BSP | REC | 100 | % | 63-144 |
| OP81701-BS | 2991-50-6 | EtFOSAA | BSP | REC | 97 | % | 61-139 |
| OP81701-BS | 757124-72-4 | 4:2 Fluorotelomer sulfonate | BSP | REC | 99 | % | 62-145 |
| OP81701-BS | 27619-97-2 | 6:2 Fluorotelomer sulfonate | BSP | REC | 100 | % | 64-140 |
| OP81701-BS | 39108-34-4 | 8:2 Fluorotelomer sulfonate | BSP | REC | 99 | % | 65-137 |
| OP81701-MS | 375-22-4 | Perfluorobutanoic acid | MS | REC | 96 | % | 71-135 |
| OP81701-MS | 2706-90-3 | Perfluoropentanoic acid | MS | REC | 94 | % | 69-132 |
| OP81701-MS | 307-24-4 | Perfluorohexanoic acid | MS | REC | 94 | % | 70-132 |
| OP81701-MS | 375-85-9 | Perfluoroheptanoic acid | MS | REC | 99 | % | 71-131 |
| OP81701-MS | 335-67-1 | Perfluorooctanoic acid | MS | REC | 96 | % | 69-133 |
| OP81701-MS | 375-95-1 | Perfluorononanoic acid | MS | REC | 98 | % | 72-129 |
| OP81701-MS | 335-76-2 | Perfluorodecanoic acid | MS | REC | 98 | % | 69-133 |
| OP81701-MS | 2058-94-8 | Perfluoroundecanoic acid | MS | REC | 96 | % | 64-136 |
| OP81701-MS | 307-55-1 | Perfluorododecanoic acid | MS | REC | 99 | % | 69-135 |
| OP81701-MS | 72629-94-8 | Perfluorotridecanoic acid | MS | REC | 83 | % | 66-139 |
| OP81701-MS | 376-06-7 | Perfluorotetradecanoic acid | MS | REC | 98 | % | 69-133 |
| OP81701-MS | 375-73-5 | Perfluorobutanesulfonic acid | MS | REC | 97 | % | 72-128 |
| OP81701-MS | 2706-91-4 | Perfluoropentanesulfonic acid | MS | REC | 92 | % | 73-123 |
| OP81701-MS | 355-46-4 | Perfluorohexanesulfonic acid | MS | REC | 97 | % | 67-130 |
| OP81701-MS | 375-92-8 | Perfluoroheptanesulfonic acid | MS | REC | 99 | % | 70-132 |
| OP81701-MS | 1763-23-1 | Perfluorooctanesulfonic acid | MS | REC | 82 | % | 67-136 |
| OP81701-MS | 68259-12-1 | Perfluorononanesulfonic acid | MS | REC | 95 | % | 69-125 |
| OP81701-MS | 335-77-3 | Perfluorodecanesulfonic acid | MS | REC | 114 | % | 59-134 |

* Sample used for QC is not from job FA77717

# QC Evaluation: DOD QSM5.x Limits



**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81701-MS | 754-91-6 | PFOSA | MS | REC | 98 | % | 67-137 |
| OP81701-MS | 2355-31-9 | MeFOSAA | MS | REC | 91 | % | 63-144 |
| OP81701-MS | 2991-50-6 | EtFOSAA | MS | REC | 106 | % | 61-139 |
| OP81701-MS | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MS | REC | 99 | % | 62-145 |
| OP81701-MS | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MS | REC | 95 | % | 64-140 |
| OP81701-MS | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MS | REC | 96 | % | 65-137 |
| OP81701-MSD | 375-22-4 | Perfluorobutanoic acid | MSD | REC | 91 | % | 71-135 |
| OP81701-MSD | 375-22-4 | Perfluorobutanoic acid | MSD | RPD | 0 | % | 30 |
| OP81701-MSD | 2706-90-3 | Perfluoropentanoic acid | MSD | REC | 88 | % | 69-132 |
| OP81701-MSD | 2706-90-3 | Perfluoropentanoic acid | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 307-24-4 | Perfluorohexanoic acid | MSD | REC | 82 | % | 70-132 |
| OP81701-MSD | 307-24-4 | Perfluorohexanoic acid | MSD | RPD | 7 | % | 30 |
| OP81701-MSD | 375-85-9 | Perfluoroheptanoic acid | MSD | REC | 90 | % | 71-131 |
| OP81701-MSD | 375-85-9 | Perfluoroheptanoic acid | MSD | RPD | 3 | % | 30 |
| OP81701-MSD | 335-67-1 | Perfluorooctanoic acid | MSD | REC | 89 | % | 69-133 |
| OP81701-MSD | 335-67-1 | Perfluorooctanoic acid | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 375-95-1 | Perfluorononanoic acid | MSD | REC | 90 | % | 72-129 |
| OP81701-MSD | 375-95-1 | Perfluorononanoic acid | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 335-76-2 | Perfluorodecanoic acid | MSD | REC | 94 | % | 69-133 |
| OP81701-MSD | 335-76-2 | Perfluorodecanoic acid | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 2058-94-8 | Perfluoroundecanoic acid | MSD | REC | 92 | % | 64-136 |
| OP81701-MSD | 2058-94-8 | Perfluoroundecanoic acid | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 307-55-1 | Perfluorododecanoic acid | MSD | REC | 91 | % | 69-135 |
| OP81701-MSD | 307-55-1 | Perfluorododecanoic acid | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 72629-94-8 | Perfluorotridecanoic acid | MSD | REC | 80 | % | 66-139 |
| OP81701-MSD | 72629-94-8 | Perfluorotridecanoic acid | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 376-06-7 | Perfluorotetradecanoic acid | MSD | REC | 91 | % | 69-133 |
| OP81701-MSD | 376-06-7 | Perfluorotetradecanoic acid | MSD | RPD | 0 | % | 30 |
| OP81701-MSD | 375-73-5 | Perfluorobutanesulfonic acid | MSD | REC | 90 | % | 72-128 |
| OP81701-MSD | 375-73-5 | Perfluorobutanesulfonic acid | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | REC | 86 | % | 73-123 |
| OP81701-MSD | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 355-46-4 | Perfluorohexanesulfonic acid | MSD | REC | 82 | % | 67-130 |
| OP81701-MSD | 355-46-4 | Perfluorohexanesulfonic acid | MSD | RPD | 9 | % | 30 |
| OP81701-MSD | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | REC | 93 | % | 70-132 |
| OP81701-MSD | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | RPD | 0 | % | 30 |
| OP81701-MSD | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | REC | 48 | % | 67-136 |
| OP81701-MSD | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | RPD | 23 | % | 30 |
| OP81701-MSD | 68259-12-1 | Perfluorononanesulfonic acid | MSD | REC | 89 | % | 69-125 |
| OP81701-MSD | 68259-12-1 | Perfluorononanesulfonic acid | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 335-77-3 | Perfluorodecanesulfonic acid | MSD | REC | 98 | % | 59-134 |
| OP81701-MSD | 335-77-3 | Perfluorodecanesulfonic acid | MSD | RPD | 9 | % | 30 |
| OP81701-MSD | 754-91-6 | PFOSA | MSD | REC | 90 | % | 67-137 |
| OP81701-MSD | 754-91-6 | PFOSA | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 2355-31-9 | MeFOSAA | MSD | REC | 90 | % | 63-144 |

* Sample used for QC is not from job FA77717

# QC Evaluation: DOD QSM5.x Limits

**Job Number:** FA77717
**Account:** SGS North America, Inc
**Project:** 1204021
**Collected:** 08/06/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81701-MSD | 2355-31-9 | MeFOSAA | MSD | RPD | 5 | % | 30 |
| OP81701-MSD | 2991-50-6 | EtFOSAA | MSD | REC | 99 | % | 61-139 |
| OP81701-MSD | 2991-50-6 | EtFOSAA | MSD | RPD | 1 | % | 30 |
| OP81701-MSD | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | REC | 91 | % | 62-145 |
| OP81701-MSD | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | REC | 87 | % | 64-140 |
| OP81701-MSD | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | RPD | 2 | % | 30 |
| OP81701-MSD | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | REC | 92 | % | 65-137 |
| OP81701-MSD | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | RPD | 1 | % | 30 |

* Sample used for QC is not from job FA77717

# MS Semi-volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Instrument Blank

**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q789-IBLK | 2Q53055.D | 1 | 08/25/20 | NAF | n/a | n/a | S2Q789 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-9

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 85% | 50-150% |
| | 13C5-PFPeA | 84% | 50-150% |
| | 13C5-PFHxA | 84% | 50-150% |
| | 13C4-PFHpA | 82% | 50-150% |
| | 13C8-PFOA | 85% | 50-150% |
| | 13C9-PFNA | 85% | 50-150% |
| | 13C6-PFDA | 88% | 50-150% |
| | 13C7-PFUnDA | 87% | 50-150% |

# Instrument Blank



**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q789-IBLK | 2Q53055.D | 1 | 08/25/20 | NAF | n/a | n/a | S2Q789 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-9

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 85% | 50-150% |
| | 13C2-PFTeDA | 87% | 50-150% |
| | 13C3-PFBS | 81% | 50-150% |
| | 13C3-PFHxS | 88% | 50-150% |
| | 13C8-PFOS | 85% | 50-150% |
| | 13C8-FOSA | 91% | 50-150% |
| | d3-MeFOSAA | 93% | 50-150% |
| | 13C2-4:2FTS | 80% | 50-150% |
| | 13C2-6:2FTS | 84% | 50-150% |
| | 13C2-8:2FTS | 81% | 50-150% |

# Instrument Blank

**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q791-IBLK | 2Q53191.D | 1 | 08/27/20 | NAF | n/a | n/a | S2Q791 |




**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 103% | 50-150% |
| | 13C5-PFPeA | 98% | 50-150% |
| | 13C5-PFHxA | 99% | 50-150% |
| | 13C4-PFHpA | 100% | 50-150% |
| | 13C8-PFOA | 100% | 50-150% |
| | 13C9-PFNA | 98% | 50-150% |
| | 13C6-PFDA | 100% | 50-150% |
| | 13C7-PFUnDA | 99% | 50-150% |

# Instrument Blank

**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q791-IBLK | 2Q53191.D | 1 | 08/27/20 | NAF | n/a | n/a | S2Q791 |




**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 98% | 50-150% |
| | 13C2-PFTeDA | 94% | 50-150% |
| | 13C3-PFBS | 99% | 50-150% |
| | 13C3-PFHxS | 100% | 50-150% |
| | 13C8-PFOS | 101% | 50-150% |
| | 13C8-FOSA | 105% | 50-150% |
| | d3-MeFOSAA | 101% | 50-150% |
| | 13C2-4:2FTS | 95% | 50-150% |
| | 13C2-6:2FTS | 96% | 50-150% |
| | 13C2-8:2FTS | 96% | 50-150% |

# Method Blank Summary

**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81701-MB | 2Q53069.D | 1 | 08/25/20 | NAF | 08/24/20 | OP81701 | S2Q789 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 0.29 | 1.0 | 0.25 | ug/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 63% | 50-150% |
| | 13C5-PFPeA | 65% | 50-150% |
| | 13C5-PFHxA | 65% | 50-150% |
| | 13C4-PFHpA | 63% | 50-150% |
| | 13C8-PFOA | 67% | 50-150% |
| | 13C9-PFNA | 68% | 50-150% |
| | 13C6-PFDA | 66% | 50-150% |
| | 13C7-PFUnDA | 67% | 50-150% |

# Method Blank Summary



**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81701-MB | 2Q53069.D | 1 | 08/25/20 | NAF | 08/24/20 | OP81701 | S2Q789 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 66% | 50-150% |
| | 13C2-PFTeDA | 70% | 50-150% |
| | 13C3-PFBS | 63% | 50-150% |
| | 13C3-PFHxS | 70% | 50-150% |
| | 13C8-PFOS | 64% | 50-150% |
| | 13C8-FOSA | 72% | 50-150% |
| | d3-MeFOSAA | 76% | 50-150% |
| | 13C2-4:2FTS | 61% | 50-150% |
| | 13C2-6:2FTS | 66% | 50-150% |
| | 13C2-8:2FTS | 63% | 50-150% |

# Blank Spike Summary



**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81701-BS | 2Q53068.D | 1 | 08/25/20 | NAF | 08/24/20 | OP81701 | S2Q789 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 10 | 10.2 | 102 | 71-135 |
| 2706-90-3 | Perfluoropentanoic acid | 10 | 9.1 | 91 | 69-132 |
| 307-24-4 | Perfluorohexanoic acid | 10 | 9.3 | 93 | 70-132 |
| 375-85-9 | Perfluoroheptanoic acid | 10 | 9.9 | 99 | 71-131 |
| 335-67-1 | Perfluorooctanoic acid | 10 | 10.2 | 102 | 69-133 |
| 375-95-1 | Perfluorononanoic acid | 10 | 9.6 | 96 | 72-129 |
| 335-76-2 | Perfluorodecanoic acid | 10 | 9.4 | 94 | 69-133 |
| 2058-94-8 | Perfluoroundecanoic acid | 10 | 9.7 | 97 | 64-136 |
| 307-55-1 | Perfluorododecanoic acid | 10 | 9.9 | 99 | 69-135 |
| 72629-94-8 | Perfluorotridecanoic acid | 10 | 9.1 | 91 | 66-139 |
| 376-06-7 | Perfluorotetradecanoic acid | 10 | 9.3 | 93 | 69-133 |
| 375-73-5 | Perfluorobutanesulfonic acid | 10 | 10.1 | 101 | 72-128 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 10 | 9.8 | 98 | 73-123 |
| 355-46-4 | Perfluorohexanesulfonic acid | 10 | 9.1 | 91 | 67-130 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 10 | 9.5 | 95 | 70-132 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 10 | 9.8 | 98 | 67-136 |
| 68259-12-1 | Perfluorononanesulfonic acid | 10 | 10 | 100 | 69-125 |
| 335-77-3 | Perfluorodecanesulfonic acid | 10 | 10.4 | 104 | 59-134 |
| 754-91-6 | PFOSA | 10 | 10 | 100 | 67-137 |
| 2355-31-9 | MeFOSAA | 10 | 10.0 | 100 | 63-144 |
| 2991-50-6 | EtFOSAA | 10 | 9.7 | 97 | 61-139 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 10 | 9.9 | 99 | 62-145 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 10 | 10.0 | 100 | 64-140 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 10 | 9.9 | 99 | 65-137 |

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C4-PFBA | 72% | 50-150% |
| | 13C5-PFPeA | 73% | 50-150% |
| | 13C5-PFHxA | 73% | 50-150% |
| | 13C4-PFHpA | 70% | 50-150% |
| | 13C8-PFOA | 75% | 50-150% |
| | 13C9-PFNA | 76% | 50-150% |
| | 13C6-PFDA | 76% | 50-150% |
| | 13C7-PFUnDA | 76% | 50-150% |

* = Outside of Control Limits.

# Blank Spike Summary



**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81701-BS | 2Q53068.D | 1 | 08/25/20 | NAF | 08/24/20 | OP81701 | S2Q789 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 76% | 50-150% |
| | 13C2-PFTeDA | 80% | 50-150% |
| | 13C3-PFBS | 71% | 50-150% |
| | 13C3-PFHxS | 79% | 50-150% |
| | 13C8-PFOS | 72% | 50-150% |
| | 13C8-FOSA | 78% | 50-150% |
| | d3-MeFOSAA | 86% | 50-150% |
| | 13C2-4:2FTS | 72% | 50-150% |
| | 13C2-6:2FTS | 77% | 50-150% |
| | 13C2-8:2FTS | 75% | 50-150% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81701-MS | 2Q53220.D | 1 | 08/27/20 | NAF | 08/24/20 | OP81701 | S2Q791 |
| OP81701-MSD | 2Q53221.D | 1 | 08/27/20 | NAF | 08/24/20 | OP81701 | S2Q791 |
| FA77717-15 [a] | 2Q53107.D | 1 | 08/26/20 | NAF | 08/24/20 | OP81701 | S2Q789 |
| FA77717-15 | 2Q53219.D | 1 | 08/27/20 | NAF | 08/24/20 | OP81701 | S2Q791 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | Compound | FA77717-15 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | Spike ug/kg | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 7.0 U [b] | | 68.9 | 66.2 | 96 | 73.3 | 66.5 | 91 | 0 | 71-135/30 |
| 2706-90-3 | Perfluoropentanoic acid | 5.4 [b] | J | 68.9 | 70.4 | 94 | 73.3 | 69.9 | 88 | 1 | 69-132/30 |
| 307-24-4 | Perfluorohexanoic acid | 15.0 [b] | | 68.9 | 80.0 | 94 | 73.3 | 74.8 | 82 | 7 | 70-132/30 |
| 375-85-9 | Perfluoroheptanoic acid | 4.2 [b] | J | 68.9 | 72.1 | 99 | 73.3 | 70.1 | 90 | 3 | 71-131/30 |
| 335-67-1 | Perfluorooctanoic acid | 7.0 U [b] | | 68.9 | 66.0 | 96 | 73.3 | 65.6 | 89 | 1 | 69-133/30 |
| 375-95-1 | Perfluorononanoic acid | 7.0 U [b] | | 68.9 | 67.6 | 98 | 73.3 | 66.1 | 90 | 2 | 72-129/30 |
| 335-76-2 | Perfluorodecanoic acid | 7.0 U [b] | | 68.9 | 67.6 | 98 | 73.3 | 69.3 | 94 | 2 | 69-133/30 |
| 2058-94-8 | Perfluoroundecanoic acid | 7.0 U [b] | | 68.9 | 66.2 | 96 | 73.3 | 67.2 | 92 | 1 | 64-136/30 |
| 307-55-1 | Perfluorododecanoic acid | 7.0 U [b] | | 68.9 | 68.2 | 99 | 73.3 | 66.7 | 91 | 2 | 69-135/30 |
| 72629-94-8 | Perfluorotridecanoic acid | 7.0 U [b] | | 68.9 | 57.2 | 83 | 73.3 | 58.6 | 80 | 2 | 66-139/30 |
| 376-06-7 | Perfluorotetradecanoic acid | 7.0 U [b] | | 68.9 | 67.2 | 98 | 73.3 | 67.0 | 91 | 0 | 69-133/30 |
| 375-73-5 | Perfluorobutanesulfonic acid | 7.0 U [b] | | 68.9 | 67.0 | 97 | 73.3 | 66.3 | 90 | 1 | 72-128/30 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 7.0 U [b] | | 68.9 | 63.6 | 92 | 73.3 | 63.0 | 86 | 1 | 73-123/30 |
| 355-46-4 | Perfluorohexanesulfonic acid | 7.9 [b] | | 68.9 | 74.5 | 97 | 73.3 | 68.4 | 82 | 9 | 67-130/30 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 7.0 U [b] | | 68.9 | 68.4 | 99 | 73.3 | 68.2 | 93 | 0 | 70-132/30 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 48.2 [b] | | 68.9 | 105 | 82 | 73.3 | 83.7 | 48* | 23 | 67-136/30 |
| 68259-12-1 | Perfluorononanesulfonic acid | 7.0 U [b] | | 68.9 | 65.7 | 95 | 73.3 | 65.1 | 89 | 1 | 69-125/30 |
| 335-77-3 | Perfluorodecanesulfonic acid | 7.0 U [b] | | 68.9 | 78.5 | 114 | 73.3 | 72.0 | 98 | 9 | 59-134/30 |
| 754-91-6 | PFOSA | 7.0 U [b] | | 68.9 | 67.5 | 98 | 73.3 | 66.0 | 90 | 2 | 67-137/30 |
| 2355-31-9 | MeFOSAA | 18 U [b] | | 68.9 | 62.6 | 91 | 73.3 | 66.0 | 90 | 5 | 63-144/30 |
| 2991-50-6 | EtFOSAA | 18 U [b] | | 68.9 | 72.7 | 106 | 73.3 | 72.3 | 99 | 1 | 61-139/30 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 7.0 U [b] | | 68.9 | 68.1 | 99 | 73.3 | 67.0 | 91 | 2 | 62-145/30 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 6.7 [b] | J | 68.9 | 72.0 | 95 | 73.3 | 70.4 | 87 | 2 | 64-140/30 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 7.0 U [b] | | 68.9 | 66.4 | 96 | 73.3 | 67.3 | 92 | 1 | 65-137/30 |

| CAS No. | ID Standard Recoveries | MS | MSD | FA77717-15 | FA77717-15 | Limits |
|---|---|---|---|---|---|---|
| | 13C4-PFBA | 59% | 61% | 50% | 61% | 50-150% |
| | 13C5-PFPeA | 53% | 57% | 44%* [c] | 55% | 50-150% |
| | 13C5-PFHxA | 47%* | 53% | 41%* [c] | 49%* [c] | 50-150% |
| | 13C4-PFHpA | 43%* | 49%* | 37%* [c] | 47%* [c] | 50-150% |
| | 13C8-PFOA | 43%* | 50% | 38%* [c] | 46%* [c] | 50-150% |
| | 13C9-PFNA | 45%* | 51% | 38%* [c] | 47%* [c] | 50-150% |
| | 13C6-PFDA | 35%* | 38%* | 32%* [c] | 36%* [c] | 50-150% |
| | 13C7-PFUnDA | 44%* | 47%* | 39%* [c] | 43%* [c] | 50-150% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** FA77717
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204021

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81701-MS | 2Q53220.D | 1 | 08/27/20 | NAF | 08/24/20 | OP81701 | S2Q791 |
| OP81701-MSD | 2Q53221.D | 1 | 08/27/20 | NAF | 08/24/20 | OP81701 | S2Q791 |
| FA77717-15 [a] | 2Q53107.D | 1 | 08/26/20 | NAF | 08/24/20 | OP81701 | S2Q789 |
| FA77717-15 | 2Q53219.D | 1 | 08/27/20 | NAF | 08/24/20 | OP81701 | S2Q791 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77717-1, FA77717-2, FA77717-3, FA77717-4, FA77717-5, FA77717-6, FA77717-7, FA77717-8, FA77717-9, FA77717-10, FA77717-11, FA77717-12, FA77717-13, FA77717-14, FA77717-15

| CAS No. | ID Standard Recoveries | MS | MSD | FA77717-15 | FA77717-15 | Limits |
|---|---|---|---|---|---|---|
| | 13C2-PFDoDA | 38%* | 44%* | 38%* [c] | 33%* [c] | 50-150% |
| | 13C2-PFTeDA | 45%* | 50% | 39%* [c] | 32%* [c] | 50-150% |
| | 13C3-PFBS | 53% | 59% | 45%* [c] | 54% | 50-150% |
| | 13C3-PFHxS | 50% | 55% | 43%* [c] | 52% | 50-150% |
| | 13C8-PFOS | 44%* | 49%* | 38%* [c] | 48%* [c] | 50-150% |
| | 13C8-FOSA | 20%* | 27%* | 22%* [c] | 22%* [c] | 50-150% |
| | d3-MeFOSAA | 40%* | 45%* | 39%* [c] | 32%* [c] | 50-150% |
| | 13C2-4:2FTS | 46%* | 53% | 40%* [c] | 47%* [c] | 50-150% |
| | 13C2-6:2FTS | 45%* | 51% | 41%* [c] | 47%* [c] | 50-150% |
| | 13C2-8:2FTS | 38%* | 42%* | 32%* [c] | 36%* [c] | 50-150% |

(a) Confirmation run for ID Standard Recoveries.
(b) Result is from Run #2.
(c) Outside control limits due to matrix interference. Confirmed by reanalysis and MS/MSD.

* = Outside of Control Limits.

# Laboratory Report of Analysis

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501

Report Number: **1204046**

Client Project: **20-2176 CRW Postmark Bog V2**

Dear Kyle Wiseman,

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 ten 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 Chuck 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.

_______________________________________________

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com



SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
**t** 907.562.2343 **f** 907.561.5301 www.us.sgs.com
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## Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1204046**
Project Name/Site: **20-2176 CRW Postmark Bog V2**
Project Contact: **Kyle Wiseman**

Refer to sample receipt form for information on sample condition.

**T1-03A (1204046001) PS**

EPA 537 PFAS was analyzed by SGS of Orlando, FL.

**LCSD for HBN 1810503 [XXX/4368 (1575621) LCSD**

AK102/103 - Surrogate recovery in the LCSD for 5a androstane does not meet QC criteria; however, the surrogate recoveries in the samples are within criteria.

**1204046001MS (1574910) MS**

9060A - Total Organic Carbon - MS recovery is outside of QC criteria. Refer to LCS for accuracy requirements.

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

Print Date: 09/03/2020 9:46:27AM

## Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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/CVA/CVB | Continuing Calibration Verification |
| CCCV/CVC/CVCA/CVCB | Closing Continuing Calibration Verification |
| CL | Control Limit |
| DF | Analytical Dilution Factor |
| DL | Detection Limit (i.e., maximum method detection limit) |
| E | The analyte result is above the calibrated range. |
| GT | Greater Than |
| IB | Instrument Blank |
| ICV | Initial Calibration Verification |
| J | The quantitation is an estimation. |
| LCS(D) | Laboratory Control Spike (Duplicate) |
| LLQC/LLIQC | Low Level Quantitation Check |
| 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 |
| MB | Method Blank |
| MS(D) | Matrix Spike (Duplicate) |
| ND | Indicates the analyte is not detected. |
| RPD | Relative Percent Difference |
| TNTC | Too Numerous To Count |
| 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.

Print Date: 09/03/2020 9:46:29AM

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
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## Sample Summary

| Client Sample ID | Lab Sample ID | Collected | Received | Matrix |
|---|---|---|---|---|
| T1-03A | 1204046001 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-03B | 1204046002 | 08/07/2020 | 08/07/2020 | Solid/Soil (Wet Weight) |
| T1-05A | 1204046003 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-05B | 1204046004 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-11A | 1204046005 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-11B | 1204046006 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-13A | 1204046007 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-13B | 1204046008 | 08/07/2020 | 08/07/2020 | Solid/Soil (Wet Weight) |
| T1-15A | 1204046009 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-XX | 1204046010 | 08/07/2020 | 08/07/2020 | Solid/Soil (Wet Weight) |
| T1-17A | 1204046011 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| T1-17B | 1204046012 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |
| Trip Blank | 1204046013 | 08/07/2020 | 08/07/2020 | Soil/Solid (dry weight) |

| Method | Method Description |
|---|---|
| AK101 | AK101/8021 Combo. (S) |
| SW8021B | AK101/8021 Combo. (S) |
| AK102 | Diesel/Residual Range Organics |
| AK103 | Diesel/Residual Range Organics |
| SM21 2540G | Percent Solids SM2540G |
| SW9060A-Mod | Total Organic Carbon-M in Soil |



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## Detectable Results Summary

Client Sample ID: **T1-03A**
Lab Sample ID: 1204046001

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 1380 | mg/kg |
| | Residual Range Organics | 17000 | mg/kg |
| **Volatile Fuels** | Gasoline Range Organics | 15.7J | mg/Kg |
| **Waters Department** | Total Organic Carbon | 33.8 | % |

Client Sample ID: **T1-05A**
Lab Sample ID: 1204046003

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 825 | mg/kg |
| | Residual Range Organics | 9220 | mg/kg |
| **Waters Department** | Total Organic Carbon | 33.0 | % |

Client Sample ID: **T1-11A**
Lab Sample ID: 1204046005

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 1700 | mg/kg |
| | Residual Range Organics | 18900 | mg/kg |
| **Waters Department** | Total Organic Carbon | 40.3 | % |

Client Sample ID: **T1-13A**
Lab Sample ID: 1204046007

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 796 | mg/kg |
| | Residual Range Organics | 9240 | mg/kg |
| **Waters Department** | Total Organic Carbon | 37.4 | % |

Client Sample ID: **T1-15A**
Lab Sample ID: 1204046009

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 875 | mg/kg |
| | Residual Range Organics | 8260 | mg/kg |
| **Waters Department** | Total Organic Carbon | 25.0 | % |

Client Sample ID: **T1-17A**
Lab Sample ID: 1204046011

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 724 | mg/kg |
| | Residual Range Organics | 8750 | mg/kg |
| **Waters Department** | Total Organic Carbon | 34.4 | % |



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Results of **T1-03A**

Client Sample ID: **T1-03A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046001
Lab Project ID: 1204046

Collection Date: 08/07/20 12:00
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):27.9
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1380 | 286 | 88.7 | mg/kg | 4 | | 08/31/20 22:16 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 126 | 50-150 | | % | 4 | | 08/31/20 22:16 |

**Batch Information**

Analytical Batch: XFC15712
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 22:16
Container ID: 1204046001-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.013 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 17000 | 1430 | 615 | mg/kg | 4 | | 08/31/20 22:16 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 82.8 | 50-150 | | % | 4 | | 08/31/20 22:16 |

**Batch Information**

Analytical Batch: XFC15712
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 22:16
Container ID: 1204046001-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.013 g
Prep Extract Vol: 5 mL



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Results of **T1-03A**

Client Sample ID: **T1-03A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046001
Lab Project ID: 1204046

Collection Date: 08/07/20 12:00
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):27.9
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 15.7 J | 43.6 | 13.1 | mg/Kg | 1 | | 08/11/20 23:16 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 101 | 50-150 | | % | 1 | | 08/11/20 23:16 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 23:16
Container ID: 1204046001-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 12:00
Prep Initial Wt./Vol.: 14.551 g
Prep Extract Vol: 35.4842 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 109 U | 218 | 69.8 | ug/kg | 1 | | 08/11/20 23:16 |
| Ethylbenzene | 218 U | 436 | 136 | ug/kg | 1 | | 08/11/20 23:16 |
| o-Xylene | 218 U | 436 | 136 | ug/kg | 1 | | 08/11/20 23:16 |
| P & M -Xylene | 437 U | 873 | 262 | ug/kg | 1 | | 08/11/20 23:16 |
| Toluene | 218 U | 436 | 136 | ug/kg | 1 | | 08/11/20 23:16 |
| Xylenes (total) | 655 U | 1310 | 398 | ug/kg | 1 | | 08/11/20 23:16 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 95.9 | 72-119 | | % | 1 | | 08/11/20 23:16 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 23:16
Container ID: 1204046001-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 12:00
Prep Initial Wt./Vol.: 14.551 g
Prep Extract Vol: 35.4842 mL



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## Results of **T1-03A**

| | |
|---|---|
| Client Sample ID: **T1-03A** | Collection Date: 08/07/20 12:00 |
| Client Project ID: **20-2176 CRW Postmark Bog V2** | Received Date: 08/07/20 16:20 |
| Lab Sample ID: 1204046001 | Matrix: Soil/Solid (dry weight) |
| Lab Project ID: 1204046 | Solids (%):27.9 |
| | Location: |

## Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 33.8 | 1.25 | 0.376 | % | 1 | | 08/15/20 13:17 |

## Batch Information

| | |
|---|---|
| Analytical Batch: WTC3027 | Prep Batch: WXX13402 |
| Analytical Method: SW9060A-Mod | Prep Method: METHOD |
| Analyst: EWW | Prep Date/Time: 08/15/20 10:30 |
| Analytical Date/Time: 08/15/20 13:17 | Prep Initial Wt./Vol.: 71.3 mg |
| Container ID: 1204046001-A | Prep Extract Vol: 1 mL |



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## Results of **T1-05A**

Client Sample ID: **T1-05A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046003
Lab Project ID: 1204046

Collection Date: 08/07/20 13:35
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):21.4
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 825 | 93.0 | 28.8 | mg/kg | 1 | | 08/31/20 03:09 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 104 | 50-150 | | % | 1 | | 08/31/20 03:09 |

### Batch Information

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 03:09
Container ID: 1204046003-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 9220 | 465 | 200 | mg/kg | 1 | | 08/31/20 03:09 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 77.8 | 50-150 | | % | 1 | | 08/31/20 03:09 |

### Batch Information

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 03:09
Container ID: 1204046003-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 5 mL



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## Results of **T1-05A**

Client Sample ID: **T1-05A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046003
Lab Project ID: 1204046

Collection Date: 08/07/20 13:35
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):21.4
Location:

## Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 23.9 U | 47.7 | 14.3 | mg/Kg | 1 | | 08/11/20 23:34 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 103 | 50-150 | | % | 1 | | 08/11/20 23:34 |

### Batch Information

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 23:34
Container ID: 1204046003-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 13:35
Prep Initial Wt./Vol.: 19.825 g
Prep Extract Vol: 40.5736 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 120 U | 239 | 76.3 | ug/kg | 1 | | 08/11/20 23:34 |
| Ethylbenzene | 239 U | 477 | 149 | ug/kg | 1 | | 08/11/20 23:34 |
| o-Xylene | 239 U | 477 | 149 | ug/kg | 1 | | 08/11/20 23:34 |
| P & M -Xylene | 477 U | 954 | 286 | ug/kg | 1 | | 08/11/20 23:34 |
| Toluene | 239 U | 477 | 149 | ug/kg | 1 | | 08/11/20 23:34 |
| Xylenes (total) | 715 U | 1430 | 435 | ug/kg | 1 | | 08/11/20 23:34 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94 | 72-119 | | % | 1 | | 08/11/20 23:34 |

### Batch Information

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 23:34
Container ID: 1204046003-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 13:35
Prep Initial Wt./Vol.: 19.825 g
Prep Extract Vol: 40.5736 mL

## Results of **T1-05A**

Client Sample ID: **T1-05A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046003
Lab Project ID: 1204046

Collection Date: 08/07/20 13:35
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):21.4
Location:

## Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 33.0 | 1.77 | 0.530 | % | 1 | | 08/15/20 13:34 |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 13:34
Container ID: 1204046003-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 66 mg
Prep Extract Vol: 1 mL



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Results of **T1-11A**

Client Sample ID: **T1-11A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046005
Lab Project ID: 1204046

Collection Date: 08/07/20 14:15
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):22.4
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1700 | | 356 | 110 | mg/kg | 4 | | 08/31/20 22:26 |
| **Surrogates** | | | | | | | | |
| 5a Androstane (surr) | 107 | | 50-150 | | % | 4 | | 08/31/20 22:26 |

**Batch Information**

Analytical Batch: XFC15712
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 22:26
Container ID: 1204046005-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.107 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 18900 | | 1780 | 766 | mg/kg | 4 | | 08/31/20 22:26 |
| **Surrogates** | | | | | | | | |
| n-Triacontane-d62 (surr) | 84.2 | | 50-150 | | % | 4 | | 08/31/20 22:26 |

**Batch Information**

Analytical Batch: XFC15712
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 22:26
Container ID: 1204046005-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.107 g
Prep Extract Vol: 5 mL



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## Results of **T1-11A**

Client Sample ID: **T1-11A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046005
Lab Project ID: 1204046

Collection Date: 08/07/20 14:15
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):22.4
Location:

## Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 24.0 U | 48.0 | 14.4 | mg/Kg | 1 | | 08/11/20 23:52 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 94.5 | 50-150 | | % | 1 | | 08/11/20 23:52 |

### Batch Information

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 23:52
Container ID: 1204046005-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 14:15
Prep Initial Wt./Vol.: 18.179 g
Prep Extract Vol: 39.109 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 120 U | 240 | 76.9 | ug/kg | 1 | | 08/11/20 23:52 |
| Ethylbenzene | 240 U | 480 | 150 | ug/kg | 1 | | 08/11/20 23:52 |
| o-Xylene | 240 U | 480 | 150 | ug/kg | 1 | | 08/11/20 23:52 |
| P & M -Xylene | 481 U | 961 | 288 | ug/kg | 1 | | 08/11/20 23:52 |
| Toluene | 240 U | 480 | 150 | ug/kg | 1 | | 08/11/20 23:52 |
| Xylenes (total) | 720 U | 1440 | 438 | ug/kg | 1 | | 08/11/20 23:52 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 95 | 72-119 | | % | 1 | | 08/11/20 23:52 |

### Batch Information

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 23:52
Container ID: 1204046005-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 14:15
Prep Initial Wt./Vol.: 18.179 g
Prep Extract Vol: 39.109 mL




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## Results of **T1-11A**

| | |
|---|---|
| Client Sample ID: **T1-11A** | Collection Date: 08/07/20 14:15 |
| Client Project ID: **20-2176 CRW Postmark Bog V2** | Received Date: 08/07/20 16:20 |
| Lab Sample ID: 1204046005 | Matrix: Soil/Solid (dry weight) |
| Lab Project ID: 1204046 | Solids (%):22.4 |
| | Location: |

## Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 40.3 | 1.54 | 0.461 | % | 1 | | 08/15/20 13:50 |

## Batch Information

| | |
|---|---|
| Analytical Batch: WTC3027 | Prep Batch: WXX13402 |
| Analytical Method: SW9060A-Mod | Prep Method: METHOD |
| Analyst: EWW | Prep Date/Time: 08/15/20 10:30 |
| Analytical Date/Time: 08/15/20 13:50 | Prep Initial Wt./Vol.: 72.6 mg |
| Container ID: 1204046005-A | Prep Extract Vol: 1 mL |



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## Results of **T1-13A**

Client Sample ID: **T1-13A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046007
Lab Project ID: 1204046

Collection Date: 08/07/20 13:05
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):14.4
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 796 | 136 | 42.3 | mg/kg | 1 | | 08/31/20 03:19 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 119 | 50-150 | | % | 1 | | 08/31/20 03:19 |

### Batch Information

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 03:19
Container ID: 1204046007-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.469 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 9240 | 682 | 293 | mg/kg | 1 | | 08/31/20 03:19 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 84.3 | 50-150 | | % | 1 | | 08/31/20 03:19 |

### Batch Information

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 03:19
Container ID: 1204046007-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.469 g
Prep Extract Vol: 5 mL



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Results of **T1-13A**

Client Sample ID: **T1-13A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046007
Lab Project ID: 1204046

Collection Date: 08/07/20 13:05
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):14.4
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 39.8 U | 79.5 | 23.8 | mg/Kg | 1 | | 08/12/20 00:10 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 98.1 | 50-150 | | % | 1 | | 08/12/20 00:10 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/12/20 00:10
Container ID: 1204046007-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 13:05
Prep Initial Wt./Vol.: 17.358 g
Prep Extract Vol: 39.8503 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 199 U | 397 | 127 | ug/kg | 1 | | 08/12/20 00:10 |
| Ethylbenzene | 398 U | 795 | 248 | ug/kg | 1 | | 08/12/20 00:10 |
| o-Xylene | 398 U | 795 | 248 | ug/kg | 1 | | 08/12/20 00:10 |
| P & M -Xylene | 795 U | 1590 | 477 | ug/kg | 1 | | 08/12/20 00:10 |
| Toluene | 398 U | 795 | 248 | ug/kg | 1 | | 08/12/20 00:10 |
| Xylenes (total) | 1190 U | 2380 | 725 | ug/kg | 1 | | 08/12/20 00:10 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 95.2 | 72-119 | | % | 1 | | 08/12/20 00:10 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/12/20 00:10
Container ID: 1204046007-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 13:05
Prep Initial Wt./Vol.: 17.358 g
Prep Extract Vol: 39.8503 mL




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Results of **T1-13A**

Client Sample ID: **T1-13A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046007
Lab Project ID: 1204046

Collection Date: 08/07/20 13:05
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):14.4
Location:

Results by **Waters Department**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 37.4 | | 2.81 | 0.843 | % | 1 | | 08/15/20 13:42 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 13:42
Container ID: 1204046007-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 61.6 mg
Prep Extract Vol: 1 mL



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## Results of T1-15A

Client Sample ID: **T1-15A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046009
Lab Project ID: 1204046

Collection Date: 08/07/20 11:10
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):46.8
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 875 | 169 | 52.3 | mg/kg | 4 | | 08/31/20 22:56 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 106 | 50-150 | | % | 4 | | 08/31/20 22:56 |

### Batch Information

Analytical Batch: XFC15712
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 22:56
Container ID: 1204046009-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.388 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 8260 | 844 | 363 | mg/kg | 4 | | 08/31/20 22:56 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 90.6 | 50-150 | | % | 4 | | 08/31/20 22:56 |

### Batch Information

Analytical Batch: XFC15712
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 22:56
Container ID: 1204046009-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.388 g
Prep Extract Vol: 5 mL



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Results of **T1-15A**

Client Sample ID: **T1-15A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046009
Lab Project ID: 1204046

Collection Date: 08/07/20 11:10
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):46.8
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 13.3 U | 26.6 | 7.99 | mg/Kg | 1 | | 08/12/20 00:28 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 89.6 | 50-150 | | % | 1 | | 08/12/20 00:28 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/12/20 00:28
Container ID: 1204046009-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 11:10
Prep Initial Wt./Vol.: 12.757 g
Prep Extract Vol: 31.7904 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 66.5 U | 133 | 42.6 | ug/kg | 1 | | 08/12/20 00:28 |
| Ethylbenzene | 133 U | 266 | 83.1 | ug/kg | 1 | | 08/12/20 00:28 |
| o-Xylene | 133 U | 266 | 83.1 | ug/kg | 1 | | 08/12/20 00:28 |
| P & M -Xylene | 267 U | 533 | 160 | ug/kg | 1 | | 08/12/20 00:28 |
| Toluene | 133 U | 266 | 83.1 | ug/kg | 1 | | 08/12/20 00:28 |
| Xylenes (total) | 400 U | 799 | 243 | ug/kg | 1 | | 08/12/20 00:28 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.9 | 72-119 | | % | 1 | | 08/12/20 00:28 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/12/20 00:28
Container ID: 1204046009-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 11:10
Prep Initial Wt./Vol.: 12.757 g
Prep Extract Vol: 31.7904 mL

Print Date: 09/03/2020 9:46:34AM

J flagging is activated

Results of **T1-15A**

Client Sample ID: **T1-15A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046009
Lab Project ID: 1204046

Collection Date: 08/07/20 11:10
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):46.8
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 25.0 | 0.892 | 0.268 | % | 1 | | 08/15/20 14:00 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 14:00
Container ID: 1204046009-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 59.9 mg
Prep Extract Vol: 1 mL



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Results of **T1-17A**

Client Sample ID: **T1-17A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046011
Lab Project ID: 1204046

Collection Date: 08/07/20 09:55
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):21.2
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 724 | | 94.3 | 29.2 | mg/kg | 1 | | 08/31/20 03:29 |
| **Surrogates** | | | | | | | | |
| 5a Androstane (surr) | 111 | | 50-150 | | % | 1 | | 08/31/20 03:29 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 03:29
Container ID: 1204046011-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.003 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 8750 | | 471 | 203 | mg/kg | 1 | | 08/31/20 03:29 |
| **Surrogates** | | | | | | | | |
| n-Triacontane-d62 (surr) | 87.1 | | 50-150 | | % | 1 | | 08/31/20 03:29 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 03:29
Container ID: 1204046011-A

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 08/19/20 13:42
Prep Initial Wt./Vol.: 30.003 g
Prep Extract Vol: 5 mL

Print Date: 09/03/2020 9:46:34AM

J flagging is activated

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Results of **T1-17A**

Client Sample ID: **T1-17A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046011
Lab Project ID: 1204046

Collection Date: 08/07/20 09:55
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):21.2
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 32.0 U | 64.0 | 19.2 | mg/Kg | 1 | | 08/12/20 00:46 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 98.7 | 50-150 | | % | 1 | | 08/12/20 00:46 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/12/20 00:46
Container ID: 1204046011-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 09:55
Prep Initial Wt./Vol.: 12.981 g
Prep Extract Vol: 35.2281 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 160 U | 320 | 102 | ug/kg | 1 | | 08/12/20 00:46 |
| Ethylbenzene | 320 U | 640 | 200 | ug/kg | 1 | | 08/12/20 00:46 |
| o-Xylene | 320 U | 640 | 200 | ug/kg | 1 | | 08/12/20 00:46 |
| P & M -Xylene | 640 U | 1280 | 384 | ug/kg | 1 | | 08/12/20 00:46 |
| Toluene | 320 U | 640 | 200 | ug/kg | 1 | | 08/12/20 00:46 |
| Xylenes (total) | 960 U | 1920 | 584 | ug/kg | 1 | | 08/12/20 00:46 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 95.8 | 72-119 | | % | 1 | | 08/12/20 00:46 |

**Batch Information**

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/12/20 00:46
Container ID: 1204046011-B

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 09:55
Prep Initial Wt./Vol.: 12.981 g
Prep Extract Vol: 35.2281 mL



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## Results of **T1-17A**

Client Sample ID: **T1-17A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046011
Lab Project ID: 1204046

Collection Date: 08/07/20 09:55
Received Date: 08/07/20 16:20
Matrix: Soil/Solid (dry weight)
Solids (%):21.2
Location:

## Results by **Waters Department**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 34.4 | | 1.95 | 0.585 | % | 1 | | 08/15/20 14:09 |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 14:09
Container ID: 1204046011-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 60.5 mg
Prep Extract Vol: 1 mL

Print Date: 09/03/2020 9:46:34AM

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## Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204046013
Lab Project ID: 1204046

Collection Date: 08/07/20 09:55
Received Date: 08/07/20 16:20
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 | 1.25 U | 2.51 | 0.754 | mg/Kg | 1 | | 08/11/20 18:09 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 114 | 50-150 | | % | 1 | | 08/11/20 18:09 |

### Batch Information

Analytical Batch: VFC15277
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/11/20 18:09
Container ID: 1204046013-A

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 09:55
Prep Initial Wt./Vol.: 49.744 g
Prep Extract Vol: 25 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 6.30 U | 12.6 | 4.02 | ug/kg | 1 | | 08/11/20 18:09 |
| Ethylbenzene | 12.6 U | 25.1 | 7.84 | ug/kg | 1 | | 08/11/20 18:09 |
| o-Xylene | 12.6 U | 25.1 | 7.84 | ug/kg | 1 | | 08/11/20 18:09 |
| P & M -Xylene | 25.1 U | 50.3 | 15.1 | ug/kg | 1 | | 08/11/20 18:09 |
| Toluene | 12.6 U | 25.1 | 7.84 | ug/kg | 1 | | 08/11/20 18:09 |
| Xylenes (total) | 37.7 U | 75.4 | 22.9 | ug/kg | 1 | | 08/11/20 18:09 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 96 | 72-119 | | % | 1 | | 08/11/20 18:09 |

### Batch Information

Analytical Batch: VFC15277
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/11/20 18:09
Container ID: 1204046013-A

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 08/07/20 09:55
Prep Initial Wt./Vol.: 49.744 g
Prep Extract Vol: 25 mL



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## Method Blank

Blank ID: MB for HBN 1810423 [SPT/11106]
Blank Lab ID: 1575293

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SM21 2540G**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Solids | 100 | | | % |

## Batch Information

Analytical Batch: SPT11106
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M
Analytical Date/Time: 8/17/2020 5:18:00PM



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## Duplicate Sample Summary

Original Sample ID: 1204181008
Duplicate Sample ID: 1575294

Analysis Date: 08/17/2020 17:18
Matrix: Soil/Solid (dry weight)

QC for Samples:

1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SM21 2540G**

| NAME | Original | Duplicate | Units | RPD (%) | RPD CL |
|---|---|---|---|---|---|
| Total Solids | 83.9 | 84.0 | % | 0.12 | (< 15 ) |

## Batch Information

Analytical Batch: SPT11106
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M

Print Date: 09/03/2020 9:46:38AM

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## Method Blank

Blank ID: MB for HBN 1810178 [VXX/36101]
Blank Lab ID: 1574160

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011, 1204046013

## Results by **AK101**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Gasoline Range Organics | 1.25U | 2.50 | 0.750 | mg/Kg |
| **Surrogates** | | | | |
| 4-Bromofluorobenzene (surr) | 87 | 50-150 | | % |

## Batch Information

Analytical Batch: VFC15277
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/11/2020 5:51:00PM

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 8/11/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204046 [VXX36101]
Blank Spike Lab ID: 1574161
Date Analyzed: 08/11/2020 16:39

Spike Duplicate ID: LCSD for HBN 1204046 [VXX36101]
Spike Duplicate Lab ID: 1574162
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011, 1204046013

## 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 | 12.5 | 13.3 | 107 | 12.5 | 13.5 | 108 | ( 60-120 ) | 1.10 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 1.25 | 90.3 | 90 | 1.25 | 92 | 92 | ( 50-150 ) | 1.90 | |

## Batch Information

Analytical Batch: **VFC15277**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36101**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2020 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL



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## Method Blank

Blank ID: MB for HBN 1810178 [VXX/36101]
Blank Lab ID: 1574160

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011, 1204046013

## Results by **SW8021B**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Benzene | 6.25U | 12.5 | 4.00 | ug/kg |
| Ethylbenzene | 12.5U | 25.0 | 7.80 | ug/kg |
| o-Xylene | 12.5U | 25.0 | 7.80 | ug/kg |
| P & M -Xylene | 25.0U | 50.0 | 15.0 | ug/kg |
| Toluene | 12.5U | 25.0 | 7.80 | ug/kg |
| Xylenes (total) | 37.5U | 75.0 | 22.8 | ug/kg |
| **Surrogates** | | | | |
| 1,4-Difluorobenzene (surr) | 98.4 | 72-119 | | % |

## Batch Information

Analytical Batch: VFC15277
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/11/2020 5:51:00PM

Prep Batch: VXX36101
Prep Method: SW5035A
Prep Date/Time: 8/11/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204046 [VXX36101]
Blank Spike Lab ID: 1574163
Date Analyzed: 08/11/2020 17:15

Spike Duplicate ID: LCSD for HBN 1204046 [VXX36101]
Spike Duplicate Lab ID: 1574164
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011, 1204046013

## Results by **SW8021B**

| Parameter | Blank Spike (ug/kg) Spike | Result | Rec (%) | Spike Duplicate (ug/kg) Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | 1250 | 1360 | 109 | 1250 | 1340 | 107 | ( 75-125 ) | 2.20 | (< 20 ) |
| Ethylbenzene | 1250 | 1140 | 91 | 1250 | 1130 | 91 | ( 75-125 ) | 0.57 | (< 20 ) |
| o-Xylene | 1250 | 1160 | 93 | 1250 | 1140 | 91 | ( 75-125 ) | 1.40 | (< 20 ) |
| P & M -Xylene | 2500 | 2280 | 91 | 2500 | 2260 | 90 | ( 80-125 ) | 1.00 | (< 20 ) |
| Toluene | 1250 | 1190 | 96 | 1250 | 1200 | 96 | ( 70-125 ) | 0.65 | (< 20 ) |
| Xylenes (total) | 3750 | 3440 | 92 | 3750 | 3400 | 91 | ( 78-124 ) | 1.10 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 1250 | 104 | 104 | 1250 | 103 | 103 | ( 72-119 ) | 0.23 | |

## Batch Information

Analytical Batch: **VFC15277**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36101**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2020 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL



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## Matrix Spike Summary

Original Sample ID: 1204053004
MS Sample ID: 1574165 MS
MSD Sample ID: 1574166 MSD

Analysis Date: 08/11/2020 18:27
Analysis Date: 08/11/2020 18:45
Analysis Date: 08/11/2020 19:03
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011, 1204046013

## Results by **SW8021B**

| | | Matrix Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 7.25J | 772 | 843 | 108 | 772 | 848 | 109 | 75-125 | 0.66 | (< 20 ) |
| Ethylbenzene | 24.6 | 772 | 765 | 96 | 772 | 777 | 98 | 75-125 | 1.60 | (< 20 ) |
| o-Xylene | 47.9 | 772 | 762 | 92 | 772 | 766 | 93 | 75-125 | 0.61 | (< 20 ) |
| P & M -Xylene | 163 | 1546 | 1609 | 94 | 1546 | 1630 | 95 | 80-125 | 1.30 | (< 20 ) |
| Toluene | 115 | 772 | 863 | 97 | 772 | 887 | 100 | 70-125 | 2.70 | (< 20 ) |
| Xylenes (total) | 211 | 2320 | 2372 | 93 | 2320 | 2393 | 94 | 78-124 | 1.10 | (< 20 ) |
| **Surrogates** | | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | | 772 | 773 | 100 | 772 | 770 | 100 | 72-119 | 0.32 | |

## Batch Information

Analytical Batch: VFC15277
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/11/2020 6:45:00PM

Prep Batch: VXX36101
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/11/2020 6:00:00AM
Prep Initial Wt./Vol.: 84.54g
Prep Extract Vol: 25.00mL



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**Method Blank**

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574906

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 11:06:25AM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL



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## Method Blank

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574911

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SW9060A-Mod**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 2:44:42PM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204046 [WXX13402]
Blank Spike Lab ID: 1574907
Date Analyzed: 08/15/2020 11:19

Spike Duplicate ID: LCSD for HBN 1204046 [WXX13402]
Spike Duplicate Lab ID: 1574908
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SW9060A-Mod**

| | Blank Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 3.35 | 3.23 | 96 | 3.35 | 3.22 | 96 | ( 75-125 ) | 0.31 | (< 25 ) |

## Batch Information

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204046 [WXX13402]
Blank Spike Lab ID: 1574912
Date Analyzed: 08/15/2020 14:59

Spike Duplicate ID: LCSD for HBN 1204046 [WXX13402]
Spike Duplicate Lab ID: 1574913
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SW9060A-Mod**

| | Blank Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 3.35 | 3.21 | 96 | 3.35 | 3.18 | 95 | ( 75-125 ) | 0.94 | (< 25 ) |

## Batch Information

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL



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## Matrix Spike Summary

Original Sample ID: 1204021014
MS Sample ID: 1574909 MS
MSD Sample ID:

QC for Samples: 1204046001

Analysis Date: 08/15/2020 12:36
Analysis Date: 08/15/2020 12:43
Analysis Date:
Matrix: Soil/Solid (dry weight)

## Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 32.1 | 7.20 | 41.0 | 123 | | | | 75-125 | | |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 12:43:57PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 53.10mg
Prep Extract Vol: 1.00mL



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## Matrix Spike Summary

Original Sample ID: 1204046001
MS Sample ID: 1574910 MS
MSD Sample ID:

Analysis Date: 08/15/2020 13:17
Analysis Date: 08/15/2020 13:26
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 33.8 | 4.98 | 40.5 | 130 * | | | | 75-125 | | |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 1:26:17PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 71.80mg
Prep Extract Vol: 1.00mL



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## Matrix Spike Summary

Original Sample ID: 1204074006
MS Sample ID: 1574914 MS
MSD Sample ID:

Analysis Date: 08/15/2020 15:20
Analysis Date: 08/15/2020 15:28
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 45.1 | 14.1 | 57.0 | 85 | | | | 75-125 | | |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 3:28:50PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 44.70mg
Prep Extract Vol: 1.00mL



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## Method Blank

Blank ID: MB for HBN 1810503 [XXX/43688]
Blank Lab ID: 1575619

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **AK102**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Diesel Range Organics | 10.0U | 20.0 | 6.20 | mg/kg |
| **Surrogates** | | | | |
| 5a Androstane (surr) | 112 | 60-120 | | % |

## Batch Information

Analytical Batch: XFC15711
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/31/2020 2:40:00AM

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 8/19/2020 1:42:49PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204046 [XXX43688]
Blank Spike Lab ID: 1575620
Date Analyzed: 08/31/2020 02:50

Spike Duplicate ID: LCSD for HBN 1204046 [XXX43688]
Spike Duplicate Lab ID: 1575621
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## 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 | 833 | 759 | 91 | 833 | 836 | 100 | ( 75-125 ) | 9.60 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 5a Androstane (surr) | 16.7 | 115 | 115 | 16.7 | 127 | 127 | * ( 60-120 ) | 10.00 | |

## Batch Information

Analytical Batch: **XFC15711**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43688**
Prep Method: **SW3550C**
Prep Date/Time: **08/19/2020 13:42**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL



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## Method Blank

Blank ID: MB for HBN 1810503 [XXX/43688]
Blank Lab ID: 1575619

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **AK103**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Residual Range Organics | 50.0U | 100 | 43.0 | mg/kg |
| **Surrogates** | | | | |
| n-Triacontane-d62 (surr) | 109 | 60-120 | | % |

## Batch Information

Analytical Batch: XFC15711
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/31/2020 2:40:00AM

Prep Batch: XXX43688
Prep Method: SW3550C
Prep Date/Time: 8/19/2020 1:42:49PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL



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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204046 [XXX43688]
Blank Spike Lab ID: 1575620
Date Analyzed: 08/31/2020 02:50

Spike Duplicate ID: LCSD for HBN 1204046 [XXX43688]
Spike Duplicate Lab ID: 1575621
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204046001, 1204046003, 1204046005, 1204046007, 1204046009, 1204046011

## Results by **AK103**

| | Blank Spike (mg/kg) | | | Spike Duplicate (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Residual Range Organics | 833 | 740 | 89 | 833 | 815 | 98 | ( 60-120 ) | 9.70 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| n-Triacontane-d62 (surr) | 16.7 | 107 | 107 | 16.7 | 117 | 117 | ( 60-120 ) | 9.20 | |

## Batch Information

Analytical Batch: **XFC15711**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43688**
Prep Method: **SW3550C**
Prep Date/Time: **08/19/2020 13:42**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL



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**SGS North America Inc.**
**CHAIN OF CUSTODY RECORD**

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**Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.**

Page 1 of 2

1204046

**Section 1**

CLIENT: RSE

CONTACT: Kyle Wiseman — PHONE #: 278-1028

PROJECT NAME: CRW Postmark Bog V2 — PROJECT/PWSID/PERMIT#: 20-2176

REPORTS TO: RSE — E-MAIL: kwiseman@restorsci.com

Profile #:

INVOICE TO: RSE — QUOTE #:

P.O. #:

**Section 3** — Preservative — Analysis*

*analyses, method and/or compound list: BTEX, Metals, PFAS

**Section 2**

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/ MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | PFAS | DRO/RRO | TOC | GRO/BTEX | | | | | | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1AC | T1-03A | 8/7/2020 | 12:00 | SOIL | 3 | G | X | X | X | X | | | | | | |
| 2A | T1-03B | 8/7/2020 | 12:16 | SOIL | 1 | G | X | | | | | | | | | |
| 3AC | T1-05A | 8/7/2020 | 13:35 | SOIL | 3 | G | X | X | X | X | | | | | | |
| 4AC | T1-05B | 8/7/2020 | 13:45 | SOIL | 3 | G | X | X | X | X | | | | | | HOLD DRO, RRO, TOC GRO, BTEX |
| 5AC | T1-11A | 8/7/2020 | 14:15 | SOIL | 3 | G | X | X | X | X | | | | | | |
| 6AC | T1-11B | 8/7/2020 | 14:35 | SOIL | 3 | G | X | X | X | X | | | | | | HOLD DRO, RRO, TOC BTEX, GRO |
| 7AC | T1-13A | 8/7/2020 | 13:05 | SOIL | 3 | G | X | X | X | X | | | | | | |
| 8A | T1-13B | 8/7/2020 | 13:15 | SOIL | 1 | G | X | | | | | | | | | |
| 9AC | T1-15A | 8/7/2020 | 11:10 | SOIL | 3 | G | X | X | X | X | | | | | | |
| 10A | T1-XX | 8/7/2020 | 14:20 | SOIL | 1 | G | X | | | | | | | | | |

**Section 5**

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| Relinquished By: (1) [signature] | 8/7/2020 | 16:19 | Received By: |
| Relinquished By: (2) | Date | Time | Received By: |
| Relinquished By: (3) | Date | Time | Received By: |
| Relinquished By: (4) | 8/7/20 | 1620 | Received For Laboratory By: [signature] |

**Section 4** — DOD Project? Yes No — Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions: Profile #364091 JM

Temp Blank °C: 4.0° #D44

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [X] Commerical Delivery [ ]

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F083-Blank_COC_20181228

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# SGS North America Inc.
# CHAIN OF CUSTODY RECORD

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**Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.**

Page 2 of 2

**Section 1**

CLIENT: RSE

CONTACT: Kyle Wiseman | PHONE #: 278-1023

PROJECT NAME: CRW Postmark Bog V2 | PROJECT/PWSID/PERMIT#: 20-2176

REPORTS TO: RSE | E-MAIL: kwiseman@restorsci.com | Profile #:

INVOICE TO: RSE | QUOTE #: | P.O. #:

Section 3 — Preservative

Analysis*

1204046

analyses ic method und list: , PFAS

**Section 2**

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/ MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | PFAS | DRO/RRO | TOC | GRO/BTEX | | | | | | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11AC | T1-17A | 8/7/2020 | 9:55 | SOIL | 3 | G | X | X | X | X | | | | | | |
| 12AC | T1-17B | 8/7/2020 | 10:15 | SOIL | 3 | G | X | X | X | X | | | | | | HOLD DRO, GRO, RRO TOC, BTEX |
| 13A | Tqlo | | | | | | | | | | | | | | | |

**Section 5**

| | Date | Time | |
|---|---|---|---|
| Relinquished By: (1) | 8/7/2020 | 10:20 | Received By: |
| Relinquished By: (2) | Date | Time | Received By: |
| Relinquished By: (3) | Date | Time | Received By: |
| Relinquished By: (4) | 8/7/20 | 1620 | Received For Laboratory By: |

**Section 4** DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 4.6° D44

or Ambient [ ]

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [X] Commerical Delivery [ ]

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F083-Blank_COC_20181228

e-Sample Receipt Form

**SGS Workorder #: 1204046**

1 2 0 4 0 4 6

| Review Criteria | Condition (Yes, No, N/A) | Exceptions Noted below |
|---|---|---|
| **Chain of Custody / Temperature Requirements** | Yes | Exemption permitted if sampler hand carries/delivers. |
| Were Custody Seals intact? Note # & location | N/A | absent |
| COC accompanied samples? | Yes | |
| DOD: Were samples received in COC corresponding coolers? | N/A | |
| | N/A | **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required |
| Temperature blank compliant* (i.e., 0-6 °C after CF)? | Yes | Cooler ID: 1 @ 4.6 °C Therm. ID: D44 |
| If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available. | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| *If >6°C, were samples collected <8 hours ago?* | N/A | |
| If <0°C, were sample containers ice free? | N/A | |
| Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed. | | |
| **Holding Time / Documentation / Sample Condition Requirements** | | Note: Refer to form F-083 "Sample Guide" for specific holding times. |
| Were samples received within holding time? | Yes | |
| Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information | Yes | |
| Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals) | Yes | |
| | N/A | ***Exemption permitted for metals (e.g,200.8/6020A). |
| Were proper containers (type/mass/volume/preservative***)used? | Yes | |
| **Volatile / LL-Hg Requirements** | | |
| Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? | Yes | |
| Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? | N/A | |
| Were all soil VOAs field extracted with MeOH+BFB? | Yes | |

**Note to Client:** Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

F102b_SRFpm_20190325

## Sample Containers and Preservatives

| Container Id | Preservative | Container Condition | Container Id | Preservative | Container Condition |
|---|---|---|---|---|---|
| 1204046001-A | No Preservative Required | OK | | | |
| 1204046001-B | Methanol field pres. 4 C | OK | | | |
| 1204046001-C | No Preservative Required | OK | | | |
| 1204046002-A | No Preservative Required | OK | | | |
| 1204046003-A | No Preservative Required | OK | | | |
| 1204046003-B | Methanol field pres. 4 C | OK | | | |
| 1204046003-C | No Preservative Required | OK | | | |
| 1204046004-A | No Preservative Required | OK | | | |
| 1204046004-B | Methanol field pres. 4 C | OK | | | |
| 1204046004-C | No Preservative Required | OK | | | |
| 1204046005-A | No Preservative Required | OK | | | |
| 1204046005-B | Methanol field pres. 4 C | OK | | | |
| 1204046005-C | No Preservative Required | OK | | | |
| 1204046006-A | No Preservative Required | OK | | | |
| 1204046006-B | Methanol field pres. 4 C | OK | | | |
| 1204046006-C | No Preservative Required | OK | | | |
| 1204046007-A | No Preservative Required | OK | | | |
| 1204046007-B | Methanol field pres. 4 C | OK | | | |
| 1204046007-C | No Preservative Required | OK | | | |
| 1204046008-A | No Preservative Required | OK | | | |
| 1204046009-A | No Preservative Required | OK | | | |
| 1204046009-B | Methanol field pres. 4 C | OK | | | |
| 1204046009-C | No Preservative Required | OK | | | |
| 1204046010-A | No Preservative Required | OK | | | |
| 1204046011-A | No Preservative Required | OK | | | |
| 1204046011-B | Methanol field pres. 4 C | OK | | | |
| 1204046011-C | No Preservative Required | OK | | | |
| 1204046012-A | No Preservative Required | OK | | | |
| 1204046012-B | Methanol field pres. 4 C | OK | | | |
| 1204046012-C | No Preservative Required | OK | | | |
| 1204046013-A | Methanol field pres. 4 C | OK | | | |

| Container Id | Preservative | Container Condition | Container Id | Preservative | Container Condition |
|---|---|---|---|---|---|

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*
*Automated Report*

# Technical Report for

## SGS North America, Inc

1204046

SGS Job Number: FA77711

Sampling Date: 08/07/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: **52**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV


Test results relate only to samples analyzed.

# Table of Contents

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SGS North America Inc.

# Sample Summary

SGS North America, Inc

1204046

**Job No:** FA77711

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| FA77711-1 | 08/07/20 | 12:00 | | 08/12/20 | SO | Soil | T1-03A |
| FA77711-2 | 08/07/20 | 12:16 | | 08/12/20 | SO | Soil | T1-03B |
| FA77711-3 | 08/07/20 | 13:35 | | 08/12/20 | SO | Soil | T1-05A |
| FA77711-4 | 08/07/20 | 13:45 | | 08/12/20 | SO | Soil | T1-05B |
| FA77711-5 | 08/07/20 | 14:15 | | 08/12/20 | SO | Soil | T1-11A |
| FA77711-6 | 08/07/20 | 14:35 | | 08/12/20 | SO | Soil | T1-11B |
| FA77711-7 | 08/07/20 | 13:05 | | 08/12/20 | SO | Soil | T1-13A |
| FA77711-8 | 08/07/20 | 13:15 | | 08/12/20 | SO | Soil | T1-13B |
| FA77711-9 | 08/07/20 | 11:10 | | 08/12/20 | SO | Soil | T1-15A |
| FA77711-10 | 08/07/20 | 14:20 | | 08/12/20 | SO | Soil | T1-XX |
| FA77711-11 | 08/07/20 | 09:55 | | 08/12/20 | SO | Soil | T1-17A |
| FA77711-12 | 08/07/20 | 10:15 | | 08/12/20 | SO | Soil | T1-17B |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

# SAMPLE DELIVERY GROUP CASE NARRATIVE



**Client:** SGS North America, Inc **Job No:** FA77711

**Site:** 1204046 **Report Date:** 8/26/2020 12:03:54 PM

12 Samples were collected on 08/07/2020 and were received at SGS North America Inc - Orlando on 08/12/2020 properly preserved, at 1.4 Deg. C and intact. These Samples received an SGS Orlando job number of FA77711. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81642

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA77936-1MS, FA77936-1MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Sample(s) FA77711-1, FA77711-10, FA77711-11, FA77711-12, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9 have surrogates outside control limits.

FA77711-1 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA77711-1 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77711-1 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77711-1 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77711-1 for 13C4-PFHpA: Outside control limits due to matrix interference.

FA77711-1 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77711-1 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77711-1 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77711-1 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77711-1 for 13C8-PFOS: Outside control limits due to matrix interference.

FA77711-1 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77711-1 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77711-1: Dilution required due to matrix interference (ID recovery standard failure).

FA77711-2 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77711-2 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA77711-2 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77711-2 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77711-2 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77711-2 for 13C3-PFHxS: Outside control limits due to matrix interference.

FA77711-2 for 13C4-PFHpA: Outside control limits due to matrix interference.

FA77711-2 for 13C5-PFHxA: Outside control limits due to matrix interference.

FA77711-2 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77711-2 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77711-2 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77711-2 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77711-2 for 13C8-PFOS: Outside control limits due to matrix interference.

FA77711-2 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77711-2 for 8:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77711-2 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77711-2: Dilution required due to matrix interference (ID recovery standard failure).

FA77711-3 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77711-3 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA77711-3 for 13C2-8:2FTS: Outside control limits due to matrix interference.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81642 (cont.)

FA77711-3 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-3 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-3 for 13C3-PFHxS: Outside control limits due to matrix interference.
FA77711-3 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-3 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77711-3 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-3 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77711-3 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77711-3 for 13C8-PFOA: Outside control limits due to matrix interference.
FA77711-3 for 13C8-PFOS: Outside control limits due to matrix interference.
FA77711-3 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77711-3 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77711-3: Dilution required due to matrix interference (ID recovery standard failure).
FA77711-4 for 13C2-6:2FTS: Outside control limits due to matrix interference.
FA77711-4 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77711-4 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-4 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-4 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-4 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-4 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77711-4 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77711-4 for 13C8-PFOA: Outside control limits due to matrix interference.
FA77711-4 for 13C8-PFOS: Outside control limits due to matrix interference.
FA77711-4 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77711-4 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77711-4: Dilution required due to matrix interference (ID recovery standard failure).
FA77711-5 for 13C2-4:2FTS: Outside control limits due to matrix interference.
FA77711-5 for 13C2-6:2FTS: Outside control limits due to matrix interference.
FA77711-5 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77711-5 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-5 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-5 for 13C3-PFBS: Outside control limits due to matrix interference.
FA77711-5 for 13C3-PFHxS: Outside control limits due to matrix interference.
FA77711-5 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-5 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77711-5 for 13C5-PFPeA: Outside control limits due to matrix interference.
FA77711-5 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-5 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77711-5 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77711-5 for 13C8-PFOA: Outside control limits due to matrix interference.
FA77711-5 for 13C8-PFOS: Outside control limits due to matrix interference.
FA77711-5 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77711-5 for 8:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
FA77711-5 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77711-5: Dilution required due to matrix interference (ID recovery standard failure).
FA77711-6 for 13C2-4:2FTS: Outside control limits due to matrix interference.
FA77711-6 for 13C2-6:2FTS: Outside control limits due to matrix interference.
FA77711-6 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77711-6 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-6 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-6 for 13C3-PFBS: Outside control limits due to matrix interference.
FA77711-6 for 13C3-PFHxS: Outside control limits due to matrix interference.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81642 (cont.)

FA77711-6 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-6 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77711-6 for 13C5-PFPeA: Outside control limits due to matrix interference.
FA77711-6 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-6 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77711-6 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77711-6 for 13C8-PFOA: Outside control limits due to matrix interference.
FA77711-6 for 13C8-PFOS: Outside control limits due to matrix interference.
FA77711-6 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77711-6 for 4:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
FA77711-6 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77711-6: Dilution required due to matrix interference (ID recovery standard failure).
FA77711-7 for 13C2-4:2FTS: Outside control limits due to matrix interference.
FA77711-7 for 13C2-6:2FTS: Outside control limits due to matrix interference.
FA77711-7 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77711-7 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-7 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-7 for 13C3-PFHxS: Outside control limits due to matrix interference.
FA77711-7 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-7 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77711-7 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-7 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77711-7 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77711-7 for 13C8-PFOA: Outside control limits due to matrix interference.
FA77711-7 for 13C8-PFOS: Outside control limits due to matrix interference.
FA77711-7 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77711-7 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77711-7 for Perfluorodecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
FA77711-7: Dilution required due to matrix interference (ID recovery standard failure).
FA77711-8 for 13C2-4:2FTS: Outside control limits due to matrix interference.
FA77711-8 for 13C2-6:2FTS: Outside control limits due to matrix interference.
FA77711-8 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77711-8 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-8 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-8 for 13C3-PFHxS: Outside control limits due to matrix interference.
FA77711-8 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-8 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77711-8 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-8 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77711-8 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77711-8 for 13C8-PFOA: Outside control limits due to matrix interference.
FA77711-8 for 13C8-PFOS: Outside control limits due to matrix interference.
FA77711-8 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77711-8 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77711-8: Dilution required due to matrix interference (ID recovery standard failure).
FA77711-9 for 13C2-6:2FTS: Outside control limits due to matrix interference.
FA77711-9 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77711-9 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77711-9 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77711-9 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77711-9 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77711-9 for 13C7-PFUnDA: Outside control limits due to matrix interference.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81642 (cont.)



FA77711-9 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77711-9 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77711-9 for 13C8-PFOS: Outside control limits due to matrix interference.

FA77711-9 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77711-9 for 8:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77711-9 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77711-9: Dilution required due to matrix interference (ID recovery standard failure).

FA77711-10 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77711-10 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA77711-10 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77711-10 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77711-10 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77711-10 for 13C3-PFBS: Outside control limits due to matrix interference.

FA77711-10 for 13C3-PFHxS: Outside control limits due to matrix interference.

FA77711-10 for 13C4-PFHpA: Outside control limits due to matrix interference.

FA77711-10 for 13C5-PFHxA: Outside control limits due to matrix interference.

FA77711-10 for 13C5-PFPeA: Outside control limits due to matrix interference.

FA77711-10 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77711-10 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77711-10 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77711-10 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77711-10 for 13C8-PFOS: Outside control limits due to matrix interference.

FA77711-10 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77711-10 for 8:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77711-10 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77711-10: Dilution required due to matrix interference (ID recovery standard failure).

FA77711-11 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77711-11 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA77711-11 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77711-11 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77711-11 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77711-11 for 13C3-PFBS: Outside control limits due to matrix interference.

FA77711-11 for 13C3-PFHxS: Outside control limits due to matrix interference.

FA77711-11 for 13C4-PFHpA: Outside control limits due to matrix interference.

FA77711-11 for 13C5-PFHxA: Outside control limits due to matrix interference.

FA77711-11 for 13C5-PFPeA: Outside control limits due to matrix interference.

FA77711-11 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77711-11 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77711-11 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77711-11 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77711-11 for 13C8-PFOS: Outside control limits due to matrix interference.

FA77711-11 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77711-11 for 8:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77711-11 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77711-11: Dilution required due to matrix interference (ID recovery standard failure).

FA77711-12 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77711-12 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA77711-12 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77711-12 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77711-12 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77711-12 for 13C3-PFBS: Outside control limits due to matrix interference.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81642 (cont.)

FA77711-12 for 13C3-PFHxS: Outside control limits due to matrix interference.

FA77711-12 for 13C4-PFHpA: Outside control limits due to matrix interference.

FA77711-12 for 13C5-PFHxA: Outside control limits due to matrix interference.

FA77711-12 for 13C5-PFPeA: Outside control limits due to matrix interference.

FA77711-12 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77711-12 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77711-12 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77711-12 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77711-12 for 13C8-PFOS: Outside control limits due to matrix interference.

FA77711-12 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77711-12 for 4:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77711-12 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77711-12: Dilution required due to matrix interference (ID recovery standard failure).

## General Chemistry By Method SM19 2540G

**Matrix:** SO **Batch ID:** GN85932

Sample(s) FA77711-5DUP were used as the QC samples for Solids, Percent.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

____________________________________

Jenna Kravitz, Client Services *(Signature on File)*

# Summary of Hits

**Job Number:** FA77711
**Account:** SGS North America, Inc
**Project:** 1204046
**Collected:** 08/07/20



| Lab Sample ID Client Sample ID Analyte | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|
| **FA77711-1 T1-03A** | | | | | |
| Perfluoropentanoic acid | 0.00080 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | 0.00072 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | 0.0010 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77711-2 T1-03B** | | | | | |
| No hits reported in this sample. | | | | | |
| **FA77711-3 T1-05A** | | | | | |
| Perfluorobutanoic acid | 0.0012 J | 0.0034 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | 0.0048 | 0.0034 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | 0.0012 J | 0.0034 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | 0.0015 J | 0.0034 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid [a] | 0.0138 J | 0.034 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | 0.0898 | 0.034 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77711-4 T1-05B** | | | | | |
| Perfluorohexanesulfonic acid | 0.0016 J | 0.0043 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77711-5 T1-11A** | | | | | |
| Perfluorobutanoic acid | 0.0014 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid [a] | 0.0088 J | 0.035 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid [a] | 0.0169 J | 0.035 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [b] | 0.0838 | 0.035 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77711-6 T1-11B** | | | | | |
| No hits reported in this sample. | | | | | |
| **FA77711-7 T1-13A** | | | | | |
| Perfluorobutanoic acid | 0.0035 J | 0.0065 | 0.0032 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | 0.0146 | 0.0065 | 0.0032 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid [a] | 0.0168 J | 0.065 | 0.032 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | 0.0028 J | 0.0065 | 0.0032 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | 0.0031 J | 0.0065 | 0.0032 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid [a] | 0.0176 J | 0.065 | 0.032 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | 0.0549 J | 0.065 | 0.032 | mg/kg | EPA 537M QSM5.3 B-15 |

# Summary of Hits

**Job Number:** FA77711
**Account:** SGS North America, Inc
**Project:** 1204046
**Collected:** 08/07/20



| Lab Sample ID / Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| **FA77711-8** | **T1-13B** | | | | | |
| Perfluorobutanoic acid | | 0.0025 J | 0.0057 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0105 | 0.0057 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0019 J | 0.0057 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0020 J | 0.0057 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | | 0.0568 J | 0.057 | 0.028 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77711-9** | **T1-15A** | | | | | |
| Perfluorobutanoic acid | | 0.00076 J | 0.0024 | 0.0012 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0023 J | 0.0024 | 0.0012 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0030 | 0.0024 | 0.0012 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0030 | 0.0024 | 0.0012 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | | 0.0083 J | 0.024 | 0.012 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77711-10** | **T1-XX** | | | | | |
| Perfluorobutanoic acid | | 0.0014 J | 0.0034 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid [a] | | 0.0079 J | 0.034 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid [a] | | 0.0145 J | 0.034 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | | 0.0412 | 0.034 | 0.017 | mg/kg | EPA 537M QSM5.3 B-15 |

**FA77711-11** **T1-17A**

No hits reported in this sample.

**FA77711-12** **T1-17B**

No hits reported in this sample.

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Dilution required due to matrix interference (ID recovery standard failure). Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

## Sample Results

Report of Analysis

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-03A | | |
| **Lab Sample ID:** | FA77711-1 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 28.1 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52970.D | 1 | 08/24/20 01:34 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53005.D | 10 | 08/24/20 14:33 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.05 g | 1.0 ml |
| Run #2 | 2.05 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.00080 | 0.0035 | 0.0017 | 0.00069 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.00072 | 0.0035 | 0.0017 | 0.00069 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0010 | 0.0035 | 0.0017 | 0.00087 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.035 U [b] | 0.087 | 0.035 | 0.017 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.035 U [b] | 0.087 | 0.035 | 0.017 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

4.1
4

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-03A | | |
| **Lab Sample ID:** | FA77711-1 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 28.1 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 65% | 63% | 50-150% |
| | 13C5-PFPeA | 59% | 64% | 50-150% |
| | 13C5-PFHxA | 54% | 63% | 50-150% |
| | 13C4-PFHpA | 45% [c] | 59% | 50-150% |
| | 13C8-PFOA | 42% [c] | 62% | 50-150% |
| | 13C9-PFNA | 36% [c] | 59% | 50-150% |
| | 13C6-PFDA | 29% [c] | 55% | 50-150% |
| | 13C7-PFUnDA | 36% [c] | 62% | 50-150% |
| | 13C2-PFDoDA | 33% [c] | 64% | 50-150% |
| | 13C2-PFTeDA | 37% [c] | 65% | 50-150% |
| | 13C3-PFBS | 61% | 65% | 50-150% |
| | 13C3-PFHxS | 52% | 66% | 50-150% |
| | 13C8-PFOS | 39% [c] | 61% | 50-150% |
| | 13C8-FOSA | 17% [c] | 52% | 50-150% |
| | d3-MeFOSAA | 28% [c] | 63% | 50-150% |
| | 13C2-4:2FTS | 51% | 58% | 50-150% |
| | 13C2-6:2FTS | 45% [c] | 65% | 50-150% |
| | 13C2-8:2FTS | 31% [c] | 53% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-03B | | |
| **Lab Sample ID:** | FA77711-2 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.9 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52971.D | 1 | 08/24/20 01:49 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53006.D | 10 | 08/24/20 14:48 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.50 g | 1.0 ml |
| Run #2 | 2.50 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0018 U | 0.0037 | 0.0018 | 0.00091 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0018 U | 0.0037 | 0.0018 | 0.00073 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0073 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0018 U | 0.0037 | 0.0018 | 0.00091 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0018 U | 0.0037 | 0.0018 | 0.00091 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.037 U [b] | 0.091 | 0.037 | 0.018 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.037 U [b] | 0.091 | 0.037 | 0.018 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-03B | | |
| **Lab Sample ID:** | FA77711-2 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.9 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.018 U [b] | 0.037 | 0.018 | 0.0091 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 60% | 56% | 50-150% |
| | 13C5-PFPeA | 53% | 56% | 50-150% |
| | 13C5-PFHxA | 47% [d] | 55% | 50-150% |
| | 13C4-PFHpA | 40% [d] | 53% | 50-150% |
| | 13C8-PFOA | 39% [d] | 56% | 50-150% |
| | 13C9-PFNA | 36% [d] | 55% | 50-150% |
| | 13C6-PFDA | 29% [d] | 45% [d] | 50-150% |
| | 13C7-PFUnDA | 38% [d] | 52% | 50-150% |
| | 13C2-PFDoDA | 35% [d] | 53% | 50-150% |
| | 13C2-PFTeDA | 33% [d] | 49% [d] | 50-150% |
| | 13C3-PFBS | 53% | 58% | 50-150% |
| | 13C3-PFHxS | 47% [d] | 60% | 50-150% |
| | 13C8-PFOS | 38% [d] | 53% | 50-150% |
| | 13C8-FOSA | 16% [d] | 44% [d] | 50-150% |
| | d3-MeFOSAA | 34% [d] | 54% | 50-150% |
| | 13C2-4:2FTS | 44% [d] | 50% | 50-150% |
| | 13C2-6:2FTS | 42% [d] | 57% | 50-150% |
| | 13C2-8:2FTS | 31% [d] | 45% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-05A | | |
| **Lab Sample ID:** | FA77711-3 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 23.8 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52972.D | 1 | 08/24/20 02:04 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53007.D | 10 | 08/24/20 15:03 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.46 g | 1.0 ml |
| Run #2 | 2.46 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0012 | 0.0034 | 0.0017 | 0.00085 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0048 | 0.0034 | 0.0017 | 0.00068 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0068 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0012 | 0.0034 | 0.0017 | 0.00085 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0015 | 0.0034 | 0.0017 | 0.00085 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0138 [b] | 0.034 | 0.017 | 0.0085 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0898 [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.034 U [b] | 0.085 | 0.034 | 0.017 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.034 U [b] | 0.085 | 0.034 | 0.017 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

4.3
4

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-05A | | |
| **Lab Sample ID:** | FA77711-3 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 23.8 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 64% | 66% | 50-150% |
| | 13C5-PFPeA | 55% | 66% | 50-150% |
| | 13C5-PFHxA | 48% [c] | 65% | 50-150% |
| | 13C4-PFHpA | 43% [c] | 61% | 50-150% |
| | 13C8-PFOA | 41% [c] | 65% | 50-150% |
| | 13C9-PFNA | 39% [c] | 67% | 50-150% |
| | 13C6-PFDA | 30% [c] | 56% | 50-150% |
| | 13C7-PFUnDA | 38% [c] | 62% | 50-150% |
| | 13C2-PFDoDA | 32% [c] | 61% | 50-150% |
| | 13C2-PFTeDA | 29% [c] | 57% | 50-150% |
| | 13C3-PFBS | 55% | 68% | 50-150% |
| | 13C3-PFHxS | 49% [c] | 71% | 50-150% |
| | 13C8-PFOS | 39% [c] | 67% | 50-150% |
| | 13C8-FOSA | 17% [c] | 51% | 50-150% |
| | d3-MeFOSAA | 35% [c] | 68% | 50-150% |
| | 13C2-4:2FTS | 45% [c] | 60% | 50-150% |
| | 13C2-6:2FTS | 44% [c] | 65% | 50-150% |
| | 13C2-8:2FTS | 31% [c] | 52% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-05B | | |
| **Lab Sample ID:** | FA77711-4 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.3 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52973.D | 1 | 08/24/20 02:19 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53008.D | 10 | 08/24/20 15:18 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.16 g | 1.0 ml |
| Run #2 | 2.16 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0022 U | 0.0043 | 0.0022 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0022 U | 0.0043 | 0.0022 | 0.00087 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0022 U | 0.0043 | 0.0022 | 0.00087 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0022 U | 0.0043 | 0.0022 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0022 U | 0.0043 | 0.0022 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0016 | 0.0043 | 0.0022 | 0.0011 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0022 U | 0.0043 | 0.0022 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.043 U [b] | 0.11 | 0.043 | 0.022 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.043 U [b] | 0.11 | 0.043 | 0.022 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0022 U | 0.0043 | 0.0022 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-05B | | |
| **Lab Sample ID:** | FA77711-4 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.3 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.022 U [b] | 0.043 | 0.022 | 0.011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 66% | 66% | 50-150% |
| | 13C5-PFPeA | 57% | 67% | 50-150% |
| | 13C5-PFHxA | 52% | 67% | 50-150% |
| | 13C4-PFHpA | 45% [c] | 63% | 50-150% |
| | 13C8-PFOA | 46% [c] | 68% | 50-150% |
| | 13C9-PFNA | 43% [c] | 68% | 50-150% |
| | 13C6-PFDA | 35% [c] | 63% | 50-150% |
| | 13C7-PFUnDA | 46% [c] | 67% | 50-150% |
| | 13C2-PFDoDA | 45% [c] | 68% | 50-150% |
| | 13C2-PFTeDA | 37% [c] | 63% | 50-150% |
| | 13C3-PFBS | 58% | 68% | 50-150% |
| | 13C3-PFHxS | 53% | 77% | 50-150% |
| | 13C8-PFOS | 42% [c] | 67% | 50-150% |
| | 13C8-FOSA | 21% [c] | 57% | 50-150% |
| | d3-MeFOSAA | 44% [c] | 71% | 50-150% |
| | 13C2-4:2FTS | 50% | 62% | 50-150% |
| | 13C2-6:2FTS | 48% [c] | 70% | 50-150% |
| | 13C2-8:2FTS | 36% [c] | 62% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-11A | | |
| **Lab Sample ID:** | FA77711-5 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 24.5 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52974.D | 1 | 08/24/20 02:33 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53009.D | 10 | 08/24/20 15:33 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.35 g | 1.0 ml |
| Run #2 | 2.35 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0014 | 0.0035 | 0.0017 | 0.00087 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0069 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0088 [b] | 0.035 | 0.017 | 0.0069 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0169 [b] | 0.035 | 0.017 | 0.0087 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid [c] | 0.0838 [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.035 U [b] | 0.087 | 0.035 | 0.017 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.035 U [b] | 0.087 | 0.035 | 0.017 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-11A | | |
| **Lab Sample ID:** | FA77711-5 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 24.5 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 55% | 54% | 50-150% |
| | 13C5-PFPeA | 47% [d] | 52% | 50-150% |
| | 13C5-PFHxA | 40% [d] | 53% | 50-150% |
| | 13C4-PFHpA | 34% [d] | 50% | 50-150% |
| | 13C8-PFOA | 32% [d] | 53% | 50-150% |
| | 13C9-PFNA | 30% [d] | 51% | 50-150% |
| | 13C6-PFDA | 23% [d] | 43% [d] | 50-150% |
| | 13C7-PFUnDA | 30% [d] | 51% | 50-150% |
| | 13C2-PFDoDA | 27% [d] | 50% | 50-150% |
| | 13C2-PFTeDA | 26% [d] | 48% [d] | 50-150% |
| | 13C3-PFBS | 47% [d] | 53% | 50-150% |
| | 13C3-PFHxS | 41% [d] | 56% | 50-150% |
| | 13C8-PFOS | 30% [d] | 49% [d] | 50-150% |
| | 13C8-FOSA | 13% [d] | 41% [d] | 50-150% |
| | d3-MeFOSAA | 28% [d] | 52% | 50-150% |
| | 13C2-4:2FTS | 38% [d] | 51% | 50-150% |
| | 13C2-6:2FTS | 35% [d] | 53% | 50-150% |
| | 13C2-8:2FTS | 21% [d] | 44% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-11B | | |
| **Lab Sample ID:** | FA77711-6 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.5 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52975.D | 1 | 08/24/20 02:48 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53010.D | 10 | 08/24/20 15:48 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.28 g | 1.0 ml |
| Run #2 | 2.28 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0027 U | 0.0053 | 0.0027 | 0.0013 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.011 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.011 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid [c] | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.053 U [b] | 0.13 | 0.053 | 0.027 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.053 U [b] | 0.13 | 0.053 | 0.027 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate [c] | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-11B | | |
| **Lab Sample ID:** | FA77711-6 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.5 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.027 U [b] | 0.053 | 0.027 | 0.013 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 50% | 53% | 50-150% |
| | 13C5-PFPeA | 39% [d] | 52% | 50-150% |
| | 13C5-PFHxA | 32% [d] | 52% | 50-150% |
| | 13C4-PFHpA | 27% [d] | 49% [d] | 50-150% |
| | 13C8-PFOA | 29% [d] | 53% | 50-150% |
| | 13C9-PFNA | 28% [d] | 52% | 50-150% |
| | 13C6-PFDA | 25% [d] | 48% [d] | 50-150% |
| | 13C7-PFUnDA | 33% [d] | 53% | 50-150% |
| | 13C2-PFDoDA | 32% [d] | 54% | 50-150% |
| | 13C2-PFTeDA | 29% [d] | 54% | 50-150% |
| | 13C3-PFBS | 38% [d] | 54% | 50-150% |
| | 13C3-PFHxS | 35% [d] | 58% | 50-150% |
| | 13C8-PFOS | 28% [d] | 52% | 50-150% |
| | 13C8-FOSA | 16% [d] | 47% [d] | 50-150% |
| | d3-MeFOSAA | 31% [d] | 57% | 50-150% |
| | 13C2-4:2FTS | 30% [d] | 48% [d] | 50-150% |
| | 13C2-6:2FTS | 31% [d] | 52% | 50-150% |
| | 13C2-8:2FTS | 24% [d] | 47% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-13A | | | |
| **Lab Sample ID:** | FA77711-7 | | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 14.4 |
| **Project:** | 1204046 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52976.D | 1 | 08/24/20 03:03 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53011.D | 10 | 08/24/20 16:03 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.15 g | 1.0 ml |
| Run #2 | 2.15 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0035 | 0.0065 | 0.0032 | 0.0016 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0146 | 0.0065 | 0.0032 | 0.0013 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0168 [b] | 0.065 | 0.032 | 0.013 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0028 | 0.0065 | 0.0032 | 0.0016 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0031 | 0.0065 | 0.0032 | 0.0016 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0176 [b] | 0.065 | 0.032 | 0.016 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0549 [b] | 0.065 | 0.032 | 0.016 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.065 U [b] | 0.16 | 0.065 | 0.032 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.065 U [b] | 0.16 | 0.065 | 0.032 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-13A | | |
| **Lab Sample ID:** | FA77711-7 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 14.4 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.032 U [b] | 0.065 | 0.032 | 0.016 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 63% | 56% | 50-150% |
| | 13C5-PFPeA | 54% | 56% | 50-150% |
| | 13C5-PFHxA | 46% [d] | 55% | 50-150% |
| | 13C4-PFHpA | 39% [d] | 52% | 50-150% |
| | 13C8-PFOA | 40% [d] | 56% | 50-150% |
| | 13C9-PFNA | 38% [d] | 57% | 50-150% |
| | 13C6-PFDA | 33% [d] | 49% [d] | 50-150% |
| | 13C7-PFUnDA | 43% [d] | 55% | 50-150% |
| | 13C2-PFDoDA | 43% [d] | 55% | 50-150% |
| | 13C2-PFTeDA | 38% [d] | 53% | 50-150% |
| | 13C3-PFBS | 52% | 53% | 50-150% |
| | 13C3-PFHxS | 48% [d] | 62% | 50-150% |
| | 13C8-PFOS | 38% [d] | 56% | 50-150% |
| | 13C8-FOSA | 15% [d] | 48% [d] | 50-150% |
| | d3-MeFOSAA | 40% [d] | 60% | 50-150% |
| | 13C2-4:2FTS | 44% [d] | 53% | 50-150% |
| | 13C2-6:2FTS | 40% [d] | 57% | 50-150% |
| | 13C2-8:2FTS | 32% [d] | 50% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.7
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# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-13B | | |
| **Lab Sample ID:** | FA77711-8 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 17.1 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52977.D | 1 | 08/24/20 03:18 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53012.D | 10 | 08/24/20 16:18 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.06 g | 1.0 ml |
| Run #2 | 2.06 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0025 | 0.0057 | 0.0028 | 0.0014 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0105 | 0.0057 | 0.0028 | 0.0011 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.011 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0019 | 0.0057 | 0.0028 | 0.0014 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0020 | 0.0057 | 0.0028 | 0.0014 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0568 [b] | 0.057 | 0.028 | 0.014 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.057 U [b] | 0.14 | 0.057 | 0.028 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.057 U [b] | 0.14 | 0.057 | 0.028 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-13B | | |
| **Lab Sample ID:** | FA77711-8 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 17.1 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.057 | 0.028 | 0.014 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 66% | 64% | 50-150% |
| | 13C5-PFPeA | 56% | 65% | 50-150% |
| | 13C5-PFHxA | 47% [c] | 64% | 50-150% |
| | 13C4-PFHpA | 40% [c] | 60% | 50-150% |
| | 13C8-PFOA | 39% [c] | 65% | 50-150% |
| | 13C9-PFNA | 39% [c] | 65% | 50-150% |
| | 13C6-PFDA | 32% [c] | 58% | 50-150% |
| | 13C7-PFUnDA | 42% [c] | 65% | 50-150% |
| | 13C2-PFDoDA | 42% [c] | 65% | 50-150% |
| | 13C2-PFTeDA | 42% [c] | 62% | 50-150% |
| | 13C3-PFBS | 54% | 67% | 50-150% |
| | 13C3-PFHxS | 48% [c] | 70% | 50-150% |
| | 13C8-PFOS | 38% [c] | 65% | 50-150% |
| | 13C8-FOSA | 16% [c] | 50% | 50-150% |
| | d3-MeFOSAA | 37% [c] | 68% | 50-150% |
| | 13C2-4:2FTS | 44% [c] | 60% | 50-150% |
| | 13C2-6:2FTS | 39% [c] | 66% | 50-150% |
| | 13C2-8:2FTS | 31% [c] | 56% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-15A | | |
| **Lab Sample ID:** | FA77711-9 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 39.3 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52978.D | 1 | 08/24/20 03:32 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53013.D | 10 | 08/24/20 16:32 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.16 g | 1.0 ml |
| Run #2 | 2.16 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.00076 | 0.0024 | 0.0012 | 0.00059 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0023 | 0.0024 | 0.0012 | 0.00047 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0030 | 0.0024 | 0.0012 | 0.00047 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0012 U | 0.0024 | 0.0012 | 0.00059 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0012 U | 0.0024 | 0.0012 | 0.00059 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0030 | 0.0024 | 0.0012 | 0.00059 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0012 U | 0.0024 | 0.0012 | 0.00059 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0083 [b] | 0.024 | 0.012 | 0.0059 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.024 U [b] | 0.059 | 0.024 | 0.012 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.024 U [b] | 0.059 | 0.024 | 0.012 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0012 U | 0.0024 | 0.0012 | 0.00059 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-15A | | |
| **Lab Sample ID:** | FA77711-9 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 39.3 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.012 U [b] | 0.024 | 0.012 | 0.0059 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 63% | 58% | 50-150% |
| | 13C5-PFPeA | 58% | 59% | 50-150% |
| | 13C5-PFHxA | 53% | 58% | 50-150% |
| | 13C4-PFHpA | 43% [d] | 54% | 50-150% |
| | 13C8-PFOA | 40% [d] | 58% | 50-150% |
| | 13C9-PFNA | 36% [d] | 56% | 50-150% |
| | 13C6-PFDA | 27% [d] | 48% [d] | 50-150% |
| | 13C7-PFUnDA | 29% [d] | 53% | 50-150% |
| | 13C2-PFDoDA | 22% [d] | 54% | 50-150% |
| | 13C2-PFTeDA | 22% [d] | 60% | 50-150% |
| | 13C3-PFBS | 58% | 57% | 50-150% |
| | 13C3-PFHxS | 50% | 69% | 50-150% |
| | 13C8-PFOS | 36% [d] | 54% | 50-150% |
| | 13C8-FOSA | 14% [d] | 51% | 50-150% |
| | d3-MeFOSAA | 24% [d] | 55% | 50-150% |
| | 13C2-4:2FTS | 51% | 55% | 50-150% |
| | 13C2-6:2FTS | 44% [d] | 58% | 50-150% |
| | 13C2-8:2FTS | 27% [d] | 49% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-XX | | |
| **Lab Sample ID:** | FA77711-10 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 22.8 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52981.D | 1 | 08/24/20 04:17 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53014.D | 10 | 08/24/20 16:47 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.57 g | 1.0 ml |
| Run #2 | 2.57 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0014 | 0.0034 | 0.0017 | 0.00085 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0068 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0079 [b] | 0.034 | 0.017 | 0.0068 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid [c] | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0145 [b] | 0.034 | 0.017 | 0.0085 | mg/kg | J |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0412 [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.034 U [b] | 0.085 | 0.034 | 0.017 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.034 U [b] | 0.085 | 0.034 | 0.017 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

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# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-XX | | |
| **Lab Sample ID:** | FA77711-10 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 22.8 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.017 U [b] | 0.034 | 0.017 | 0.0085 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 58% | 57% | 50-150% |
| | 13C5-PFPeA | 44% [d] | 57% | 50-150% |
| | 13C5-PFHxA | 37% [d] | 56% | 50-150% |
| | 13C4-PFHpA | 32% [d] | 52% | 50-150% |
| | 13C8-PFOA | 33% [d] | 56% | 50-150% |
| | 13C9-PFNA | 32% [d] | 53% | 50-150% |
| | 13C6-PFDA | 24% [d] | 46% [d] | 50-150% |
| | 13C7-PFUnDA | 32% [d] | 52% | 50-150% |
| | 13C2-PFDoDA | 27% [d] | 48% [d] | 50-150% |
| | 13C2-PFTeDA | 22% [d] | 39% [d] | 50-150% |
| | 13C3-PFBS | 44% [d] | 57% | 50-150% |
| | 13C3-PFHxS | 40% [d] | 62% | 50-150% |
| | 13C8-PFOS | 33% [d] | 52% | 50-150% |
| | 13C8-FOSA | 11% [d] | 35% [d] | 50-150% |
| | d3-MeFOSAA | 29% [d] | 51% | 50-150% |
| | 13C2-4:2FTS | 35% [d] | 52% | 50-150% |
| | 13C2-6:2FTS | 37% [d] | 57% | 50-150% |
| | 13C2-8:2FTS | 24% [d] | 46% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-17A | | | |
| **Lab Sample ID:** | FA77711-11 | | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 17.1 |
| **Project:** | 1204046 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52982.D | 1 | 08/24/20 04:31 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53017.D | 10 | 08/24/20 17:31 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.08 g | 1.0 ml |
| Run #2 | 2.08 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.011 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.011 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.056 U [b] | 0.14 | 0.056 | 0.028 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.056 U [b] | 0.14 | 0.056 | 0.028 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-17A | | |
| **Lab Sample ID:** | FA77711-11 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 17.1 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 58% | 55% | 50-150% |
| | 13C5-PFPeA | 48% [d] | 56% | 50-150% |
| | 13C5-PFHxA | 40% [d] | 54% | 50-150% |
| | 13C4-PFHpA | 34% [d] | 52% | 50-150% |
| | 13C8-PFOA | 36% [d] | 56% | 50-150% |
| | 13C9-PFNA | 35% [d] | 57% | 50-150% |
| | 13C6-PFDA | 28% [d] | 51% | 50-150% |
| | 13C7-PFUnDA | 39% [d] | 57% | 50-150% |
| | 13C2-PFDoDA | 37% [d] | 56% | 50-150% |
| | 13C2-PFTeDA | 35% [d] | 51% | 50-150% |
| | 13C3-PFBS | 46% [d] | 55% | 50-150% |
| | 13C3-PFHxS | 42% [d] | 60% | 50-150% |
| | 13C8-PFOS | 35% [d] | 54% | 50-150% |
| | 13C8-FOSA | 17% [d] | 45% [d] | 50-150% |
| | d3-MeFOSAA | 37% [d] | 62% | 50-150% |
| | 13C2-4:2FTS | 38% [d] | 51% | 50-150% |
| | 13C2-6:2FTS | 37% [d] | 57% | 50-150% |
| | 13C2-8:2FTS | 27% [d] | 49% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-17B | | |
| **Lab Sample ID:** | FA77711-12 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 19.8 |
| **Project:** | 1204046 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 2Q52983.D | 1 | 08/24/20 04:46 | NAF | 08/20/20 12:00 | OP81642 | S2Q787 |
| Run #2 [a] | 2Q53018.D | 10 | 08/24/20 17:46 | NAF | 08/20/20 12:00 | OP81642 | S2Q788 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.38 g | 1.0 ml |
| Run #2 | 2.38 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.0085 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.0085 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.042 U [b] | 0.11 | 0.042 | 0.021 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.042 U [b] | 0.11 | 0.042 | 0.021 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-17B | | |
| **Lab Sample ID:** | FA77711-12 | **Date Sampled:** | 08/07/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 19.8 |
| **Project:** | 1204046 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 52% | 54% | 50-150% |
| | 13C5-PFPeA | 42% [d] | 54% | 50-150% |
| | 13C5-PFHxA | 33% [d] | 54% | 50-150% |
| | 13C4-PFHpA | 30% [d] | 51% | 50-150% |
| | 13C8-PFOA | 31% [d] | 55% | 50-150% |
| | 13C9-PFNA | 29% [d] | 55% | 50-150% |
| | 13C6-PFDA | 24% [d] | 49% [d] | 50-150% |
| | 13C7-PFUnDA | 31% [d] | 54% | 50-150% |
| | 13C2-PFDoDA | 27% [d] | 54% | 50-150% |
| | 13C2-PFTeDA | 31% [d] | 51% | 50-150% |
| | 13C3-PFBS | 40% [d] | 53% | 50-150% |
| | 13C3-PFHxS | 36% [d] | 57% | 50-150% |
| | 13C8-PFOS | 29% [d] | 55% | 50-150% |
| | 13C8-FOSA | 13% [d] | 43% [d] | 50-150% |
| | d3-MeFOSAA | 30% [d] | 60% | 50-150% |
| | 13C2-4:2FTS | 31% [d] | 49% [d] | 50-150% |
| | 13C2-6:2FTS | 33% [d] | 55% | 50-150% |
| | 13C2-8:2FTS | 23% [d] | 47% [d] | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Misc. Forms

## Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA77711

**SGS North America Inc.**
**CHAIN OF CUSTODY RECORD**

Locations Nationwide

| | |
|---|---|
| Alaska | Florida |
| New Jersey | Colorado |
| Texas | North Carolina |
| Virginia | Louisiana |

www.us.sgs.com

| | | | |
|---|---|---|---|
| CLIENT: | SGS North America Inc. - Alaska Division | SGS Reference: | SGS Orlando, FL |
| CONTACT: Julie Shumway | PHONE NO: (907) 562-2343 | Additional Comments: All soils report out in dry weight unless | Page 1 of 2 |
| PROJECT NAME: 1204046 | PWSID#: NPDL#: | | |
| REPORTS TO: Julie Shumway | E-MAIL: Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com | | |
| INVOICE TO: SGS - Alaska | QUOTE #: P.O. #: 1204046 | | |

INITIAL ASSESSMENT BA6
LABEL VERIFICATION AK

Preservative Used: NONE

TYPE C = COMP G = GRAB MI = Multi Incremental Soils

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HHMM | MATRIX/ MATRIX CODE | # CONTAINERS | TYPE | EPA 537 PFAS | | | | MS | MSD | SGS lab # | Location ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | T1-03A | 08/07/2020 | 12:00:00 | SO | 1 | | X | | | | | | 1204046001 | |
| 2 | T1-03B | 08/07/2020 | 12:16:00 | Solid | 1 | | X | | | | | | 1204046002 | |
| 3 | T1-05A | 08/07/2020 | 13:35:00 | SO | 1 | | X | | | | | | 1204046003 | |
| 4 | T1-05B | 08/07/2020 | 13:45:00 | SO | 1 | | X | | | | | | 1204046004 | |
| 5 | T1-11A | 08/07/2020 | 14:15:00 | SO | 1 | | X | | | | | | 1204046005 | |
| 6 | T1-11B | 08/07/2020 | 14:35:00 | SO | 1 | | X | | | | | | 1204046006 | |
| 7 | T1-13A | 08/07/2020 | 13:05:00 | SO | 1 | | X | | | | | | 1204046007 | |
| 8 | T1-13B | 08/07/2020 | 13:15:00 | Solid | 1 | | X | | | | | | 1204046008 | |
| 9 | T1-15A | 08/07/2020 | 11:10:00 | SO | 1 | | X | | | | | | 1204046009 | |
| 10 | T1-XX | 08/07/2020 | 14:20:00 | Solid | 1 | | X | | | | | | 1204046010 | |

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) J Shumway | 8/11/20 | 0959 | Fedex |
| (2) Fedex | 8/12/20 | 945 | [illegible signature] |
| (3) | | | |
| (4) | | | Received For Laboratory By: |

DOD Project? YES

Report to DL (J Flags)? YES
If J- Report as DL/LOD/LOQ.

Data Deliverable Requirements: Level 2

Cooler ID:

Requested Turnaround Time and-or Special Instructions:

Temp Blank °C: 1.9

or Ambient [ ]

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411

**FA77711: Chain of Custody**
**Page 1 of 3**

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FA77711

## SGS North America Inc.
## CHAIN OF CUSTODY RECORD

Locations Nationwide
Alaska | Florida
New Jersey | Colorado
Texas | North Carolina
Virginia | Louisiana
www.us.sgs.com

| | | | |
|---|---|---|---|
| CLIENT: | SGS North America Inc. - Alaska Division | SGS Reference: | Page 2 of 2 |
| CONTACT: Julie Shumway | PHONE NO: (907) 562-2343 | Additional Comments: All soils report out in dry weight unless | |
| PROJECT NAME: 1204046 | PWSID#: NPDL#: | | |
| REPORTS TO: Julie Shumway | E-MAIL: Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com | | |
| INVOICE TO: SGS - Alaska | QUOTE #: P.O. #: 1204046 | | |

Preservative Used: NONE

TYPE C = COMP G = GRAB MI = Multi Incremental Soils

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HHMM | MATRIX/ MATRIX CODE | # CONTAINERS | TYPE | EPA 537 PFAS | | | | | MS | MSD | SGS lab # | Location ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | T1-17A | 08/07/2020 | 09:55:00 | SO | 1 | | X | | | | | | | 1204046011 | |
| 12 | T1-17B | 08/07/2020 | 10:15:00 | SO | 1 | | X | | | | | | | 1204046012 | |

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) J Shumway | 8/11/20 | 0959 | Fedex |
| (2) Fedex | 8/12/20 | 945 | [illegible signature] |
| (3) | | | |
| (4) | | | Received For Laboratory By: |

DOD Project? YES

Report to DL (J Flags)? YES
If J- Report as DL/LOD/LOQ.

Data Deliverable Requirements: Level 2

Cooler ID:

Requested Turnaround Time and-or Special Instructions:

Temp Blank °C:

or Ambient [ ]

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411



FA77711: Chain of Custody
Page 2 of 3

# SGS Sample Receipt Summary

**Job Number:** FA77711 **Client:** SGS NORTH AMERICA, INC. - ALASKA DI **Project:** 1204046

**Date / Time Received:** 8/12/2020 9:45:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 148348008273

**Therm ID:** **Therm CF:** **# of Coolers:** N/A

**Cooler Temps (Raw Measured) °C:**

**Cooler Temps (Corrected) °C:**

| Cooler Information | Y | N |
|---|---|---|
| 1. Custody Seals Present | ☑ | ☐ |
| 2. Custody Seals Intact | ☑ | ☐ |
| 3. Temp criteria achieved | ☐ | ☐ |
| 4. Cooler temp verification | N/A | |
| 5. Cooler media | N/A | |

| Trip Blank Information | Y | N | N/A |
|---|---|---|---|
| 1. Trip Blank present / cooler | ☐ | ☐ | ☑ |
| 2. Trip Blank listed on COC | ☐ | ☐ | ☑ |

| | W | S | N/A |
|---|---|---|---|
| 3. Type Of TB Received | ☐ | ☐ | ☑ |

| Sample Information | Y | N | N/A |
|---|---|---|---|
| 1. Sample labels present on bottles | ☑ | ☐ | |
| 2. Samples preserved properly | ☑ | ☐ | |
| 3. Sufficient volume/containers recvd for analysis: | ☑ | ☐ | |
| 4. Condition of sample | Intact | | |
| 5. Sample recvd within HT | ☑ | ☐ | |
| 6. Dates/Times/IDs on COC match Sample Label | ☑ | ☐ | |
| 7. VOCs have headspace | ☐ | ☐ | ☑ |
| 8. Bottles received for unspecified tests | ☐ | ☑ | |
| 9. Compositing instructions clear | ☐ | ☐ | ☑ |
| 10. Voa Soil Kits/Jars received past 48hrs? | ☐ | ☐ | ☑ |
| 11. % Solids Jar received? | ☐ | ☐ | ☑ |
| 12. Residual Chlorine Present? | ☐ | ☐ | ☑ |

**Misc. Information**

Number of Encores: 25-Gram ______ 5-Gram ______ Number of 5035 Field Kits: ______ Number of Lab Filtered Metals: ______

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) ______ ______

Residual Chlorine Test Strip Lot #: ______

Comments

SM001
Rev. Date 05/24/17

Technician: BRYANG Date: 8/12/2020 9:45:00 AM Reviewer: ______ Date: ______

FA77711: Chain of Custody
Page 3 of 3

# QC Evaluation: DOD QSM5.x Limits



**Job Number:** FA77711
**Account:** SGS North America, Inc
**Project:** 1204046
**Collected:** 08/07/20

| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81642 | EPA 537M QSM5.3 B-15 | | | | | | |
| OP81642-BS | 375-22-4 | Perfluorobutanoic acid | BSP | REC | 86 | % | 71-135 |
| OP81642-BS | 2706-90-3 | Perfluoropentanoic acid | BSP | REC | 85 | % | 69-132 |
| OP81642-BS | 307-24-4 | Perfluorohexanoic acid | BSP | REC | 82 | % | 70-132 |
| OP81642-BS | 375-85-9 | Perfluoroheptanoic acid | BSP | REC | 92 | % | 71-131 |
| OP81642-BS | 335-67-1 | Perfluorooctanoic acid | BSP | REC | 91 | % | 69-133 |
| OP81642-BS | 375-95-1 | Perfluorononanoic acid | BSP | REC | 88 | % | 72-129 |
| OP81642-BS | 335-76-2 | Perfluorodecanoic acid | BSP | REC | 82 | % | 69-133 |
| OP81642-BS | 2058-94-8 | Perfluoroundecanoic acid | BSP | REC | 89 | % | 64-136 |
| OP81642-BS | 307-55-1 | Perfluorododecanoic acid | BSP | REC | 88 | % | 69-135 |
| OP81642-BS | 72629-94-8 | Perfluorotridecanoic acid | BSP | REC | 92 | % | 66-139 |
| OP81642-BS | 376-06-7 | Perfluorotetradecanoic acid | BSP | REC | 89 | % | 69-133 |
| OP81642-BS | 375-73-5 | Perfluorobutanesulfonic acid | BSP | REC | 89 | % | 72-128 |
| OP81642-BS | 2706-91-4 | Perfluoropentanesulfonic acid | BSP | REC | 85 | % | 73-123 |
| OP81642-BS | 355-46-4 | Perfluorohexanesulfonic acid | BSP | REC | 81 | % | 67-130 |
| OP81642-BS | 375-92-8 | Perfluoroheptanesulfonic acid | BSP | REC | 86 | % | 70-132 |
| OP81642-BS | 1763-23-1 | Perfluorooctanesulfonic acid | BSP | REC | 87 | % | 67-136 |
| OP81642-BS | 68259-12-1 | Perfluorononanesulfonic acid | BSP | REC | 85 | % | 69-125 |
| OP81642-BS | 335-77-3 | Perfluorodecanesulfonic acid | BSP | REC | 91 | % | 59-134 |
| OP81642-BS | 754-91-6 | PFOSA | BSP | REC | 92 | % | 67-137 |
| OP81642-BS | 2355-31-9 | MeFOSAA | BSP | REC | 88 | % | 63-144 |
| OP81642-BS | 2991-50-6 | EtFOSAA | BSP | REC | 89 | % | 61-139 |
| OP81642-BS | 757124-72-4 | 4:2 Fluorotelomer sulfonate | BSP | REC | 89 | % | 62-145 |
| OP81642-BS | 27619-97-2 | 6:2 Fluorotelomer sulfonate | BSP | REC | 89 | % | 64-140 |
| OP81642-BS | 39108-34-4 | 8:2 Fluorotelomer sulfonate | BSP | REC | 90 | % | 65-137 |
| OP81642-MS* | 375-22-4 | Perfluorobutanoic acid | MS | REC | 94 | % | 71-135 |
| OP81642-MS* | 2706-90-3 | Perfluoropentanoic acid | MS | REC | 93 | % | 69-132 |
| OP81642-MS* | 307-24-4 | Perfluorohexanoic acid | MS | REC | 90 | % | 70-132 |
| OP81642-MS* | 375-85-9 | Perfluoroheptanoic acid | MS | REC | 102 | % | 71-131 |
| OP81642-MS* | 335-67-1 | Perfluorooctanoic acid | MS | REC | 100 | % | 69-133 |
| OP81642-MS* | 375-95-1 | Perfluorononanoic acid | MS | REC | 97 | % | 72-129 |
| OP81642-MS* | 335-76-2 | Perfluorodecanoic acid | MS | REC | 91 | % | 69-133 |
| OP81642-MS* | 2058-94-8 | Perfluoroundecanoic acid | MS | REC | 96 | % | 64-136 |
| OP81642-MS* | 307-55-1 | Perfluorododecanoic acid | MS | REC | 97 | % | 69-135 |
| OP81642-MS* | 72629-94-8 | Perfluorotridecanoic acid | MS | REC | 105 | % | 66-139 |
| OP81642-MS* | 376-06-7 | Perfluorotetradecanoic acid | MS | REC | 97 | % | 69-133 |
| OP81642-MS* | 375-73-5 | Perfluorobutanesulfonic acid | MS | REC | 97 | % | 72-128 |
| OP81642-MS* | 2706-91-4 | Perfluoropentanesulfonic acid | MS | REC | 95 | % | 73-123 |
| OP81642-MS* | 355-46-4 | Perfluorohexanesulfonic acid | MS | REC | 87 | % | 67-130 |
| OP81642-MS* | 375-92-8 | Perfluoroheptanesulfonic acid | MS | REC | 93 | % | 70-132 |
| OP81642-MS* | 1763-23-1 | Perfluorooctanesulfonic acid | MS | REC | 90 | % | 67-136 |
| OP81642-MS* | 68259-12-1 | Perfluorononanesulfonic acid | MS | REC | 94 | % | 69-125 |
| OP81642-MS* | 335-77-3 | Perfluorodecanesulfonic acid | MS | REC | 98 | % | 59-134 |

* Sample used for QC is not from job FA77711

# QC Evaluation: DOD QSM5.x Limits



**Job Number:** FA77711
**Account:** SGS North America, Inc
**Project:** 1204046
**Collected:** 08/07/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81642-MS* | 754-91-6 | PFOSA | MS | REC | 101 | % | 67-137 |
| OP81642-MS* | 2355-31-9 | MeFOSAA | MS | REC | 96 | % | 63-144 |
| OP81642-MS* | 2991-50-6 | EtFOSAA | MS | REC | 105 | % | 61-139 |
| OP81642-MS* | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MS | REC | 96 | % | 62-145 |
| OP81642-MS* | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MS | REC | 98 | % | 64-140 |
| OP81642-MS* | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MS | REC | 96 | % | 65-137 |
| OP81642-MSD* | 375-22-4 | Perfluorobutanoic acid | MSD | REC | 93 | % | 71-135 |
| OP81642-MSD* | 375-22-4 | Perfluorobutanoic acid | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 2706-90-3 | Perfluoropentanoic acid | MSD | REC | 93 | % | 69-132 |
| OP81642-MSD* | 2706-90-3 | Perfluoropentanoic acid | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 307-24-4 | Perfluorohexanoic acid | MSD | REC | 89 | % | 70-132 |
| OP81642-MSD* | 307-24-4 | Perfluorohexanoic acid | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 375-85-9 | Perfluoroheptanoic acid | MSD | REC | 101 | % | 71-131 |
| OP81642-MSD* | 375-85-9 | Perfluoroheptanoic acid | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 335-67-1 | Perfluorooctanoic acid | MSD | REC | 97 | % | 69-133 |
| OP81642-MSD* | 335-67-1 | Perfluorooctanoic acid | MSD | RPD | 4 | % | 30 |
| OP81642-MSD* | 375-95-1 | Perfluorononanoic acid | MSD | REC | 95 | % | 72-129 |
| OP81642-MSD* | 375-95-1 | Perfluorononanoic acid | MSD | RPD | 3 | % | 30 |
| OP81642-MSD* | 335-76-2 | Perfluorodecanoic acid | MSD | REC | 89 | % | 69-133 |
| OP81642-MSD* | 335-76-2 | Perfluorodecanoic acid | MSD | RPD | 4 | % | 30 |
| OP81642-MSD* | 2058-94-8 | Perfluoroundecanoic acid | MSD | REC | 94 | % | 64-136 |
| OP81642-MSD* | 2058-94-8 | Perfluoroundecanoic acid | MSD | RPD | 3 | % | 30 |
| OP81642-MSD* | 307-55-1 | Perfluorododecanoic acid | MSD | REC | 95 | % | 69-135 |
| OP81642-MSD* | 307-55-1 | Perfluorododecanoic acid | MSD | RPD | 3 | % | 30 |
| OP81642-MSD* | 72629-94-8 | Perfluorotridecanoic acid | MSD | REC | 105 | % | 66-139 |
| OP81642-MSD* | 72629-94-8 | Perfluorotridecanoic acid | MSD | RPD | 1 | % | 30 |
| OP81642-MSD* | 376-06-7 | Perfluorotetradecanoic acid | MSD | REC | 94 | % | 69-133 |
| OP81642-MSD* | 376-06-7 | Perfluorotetradecanoic acid | MSD | RPD | 4 | % | 30 |
| OP81642-MSD* | 375-73-5 | Perfluorobutanesulfonic acid | MSD | REC | 97 | % | 72-128 |
| OP81642-MSD* | 375-73-5 | Perfluorobutanesulfonic acid | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | REC | 93 | % | 73-123 |
| OP81642-MSD* | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | RPD | 3 | % | 30 |
| OP81642-MSD* | 355-46-4 | Perfluorohexanesulfonic acid | MSD | REC | 87 | % | 67-130 |
| OP81642-MSD* | 355-46-4 | Perfluorohexanesulfonic acid | MSD | RPD | 1 | % | 30 |
| OP81642-MSD* | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | REC | 93 | % | 70-132 |
| OP81642-MSD* | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | RPD | 1 | % | 30 |
| OP81642-MSD* | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | REC | 88 | % | 67-136 |
| OP81642-MSD* | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 68259-12-1 | Perfluorononanesulfonic acid | MSD | REC | 92 | % | 69-125 |
| OP81642-MSD* | 68259-12-1 | Perfluorononanesulfonic acid | MSD | RPD | 3 | % | 30 |
| OP81642-MSD* | 335-77-3 | Perfluorodecanesulfonic acid | MSD | REC | 99 | % | 59-134 |
| OP81642-MSD* | 335-77-3 | Perfluorodecanesulfonic acid | MSD | RPD | 1 | % | 30 |
| OP81642-MSD* | 754-91-6 | PFOSA | MSD | REC | 97 | % | 67-137 |
| OP81642-MSD* | 754-91-6 | PFOSA | MSD | RPD | 5 | % | 30 |
| OP81642-MSD* | 2355-31-9 | MeFOSAA | MSD | REC | 93 | % | 63-144 |

* Sample used for QC is not from job FA77711

# QC Evaluation: DOD QSM5.x Limits

**Job Number:** FA77711
**Account:** SGS North America, Inc
**Project:** 1204046
**Collected:** 08/07/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81642-MSD* | 2355-31-9 | MeFOSAA | MSD | RPD | 5 | % | 30 |
| OP81642-MSD* | 2991-50-6 | EtFOSAA | MSD | REC | 104 | % | 61-139 |
| OP81642-MSD* | 2991-50-6 | EtFOSAA | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | REC | 95 | % | 62-145 |
| OP81642-MSD* | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | REC | 98 | % | 64-140 |
| OP81642-MSD* | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | RPD | 2 | % | 30 |
| OP81642-MSD* | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | REC | 95 | % | 65-137 |
| OP81642-MSD* | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | RPD | 2 | % | 30 |

* Sample used for QC is not from job FA77711

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# MS Semi-volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Instrument Blank

**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q787-IBLK | 2Q52901.D | 1 | 08/23/20 | NAF | n/a | n/a | S2Q787 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 99% | 50-150% |
| | 13C5-PFPeA | 88% | 50-150% |
| | 13C5-PFHxA | 89% | 50-150% |
| | 13C4-PFHpA | 91% | 50-150% |
| | 13C8-PFOA | 90% | 50-150% |
| | 13C9-PFNA | 89% | 50-150% |
| | 13C6-PFDA | 92% | 50-150% |
| | 13C7-PFUnDA | 93% | 50-150% |
| | 13C2-PFDoDA | 91% | 50-150% |
| | 13C2-PFTeDA | 83% | 50-150% |
| | 13C3-PFBS | 93% | 50-150% |
| | 13C3-PFHxS | 95% | 50-150% |
| | 13C8-PFOS | 94% | 50-150% |
| | 13C8-FOSA | 96% | 50-150% |
| | d3-MeFOSAA | 88% | 50-150% |
| | 13C2-4:2FTS | 85% | 50-150% |
| | 13C2-6:2FTS | 87% | 50-150% |
| | 13C2-8:2FTS | 85% | 50-150% |

# Instrument Blank

**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q788-IBLK | 2Q52990.D | 1 | 08/24/20 | NAF | n/a | n/a | S2Q788 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711
10, FA77711-11, FA77711-12

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 89% | 50-150% |
| | 13C5-PFPeA | 84% | 50-150% |
| | 13C5-PFHxA | 83% | 50-150% |
| | 13C4-PFHpA | 83% | 50-150% |
| | 13C8-PFOA | 85% | 50-150% |
| | 13C9-PFNA | 85% | 50-150% |
| | 13C6-PFDA | 89% | 50-150% |
| | 13C7-PFUnDA | 87% | 50-150% |
| | 13C2-PFDoDA | 85% | 50-150% |

# Instrument Blank



**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q788-IBLK | 2Q52990.D | 1 | 08/24/20 | NAF | n/a | n/a | S2Q788 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFTeDA | 81% | 50-150% |
| | 13C3-PFBS | 84% | 50-150% |
| | 13C3-PFHxS | 88% | 50-150% |
| | 13C8-PFOS | 87% | 50-150% |
| | 13C8-FOSA | 95% | 50-150% |
| | d3-MeFOSAA | 92% | 50-150% |
| | 13C2-4:2FTS | 82% | 50-150% |
| | 13C2-6:2FTS | 86% | 50-150% |
| | 13C2-8:2FTS | 85% | 50-150% |

# Method Blank Summary



**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81642-MB | 2Q52958.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 81% | 50-150% |
| | 13C5-PFPeA | 77% | 50-150% |
| | 13C5-PFHxA | 78% | 50-150% |
| | 13C4-PFHpA | 76% | 50-150% |
| | 13C8-PFOA | 79% | 50-150% |
| | 13C9-PFNA | 77% | 50-150% |
| | 13C6-PFDA | 81% | 50-150% |
| | 13C7-PFUnDA | 81% | 50-150% |

# Method Blank Summary



**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81642-MB | 2Q52958.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 81% | 50-150% |
| | 13C2-PFTeDA | 76% | 50-150% |
| | 13C3-PFBS | 78% | 50-150% |
| | 13C3-PFHxS | 82% | 50-150% |
| | 13C8-PFOS | 80% | 50-150% |
| | 13C8-FOSA | 85% | 50-150% |
| | d3-MeFOSAA | 81% | 50-150% |
| | 13C2-4:2FTS | 72% | 50-150% |
| | 13C2-6:2FTS | 75% | 50-150% |
| | 13C2-8:2FTS | 75% | 50-150% |

# Blank Spike Summary

**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81642-BS | 2Q52957.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 10 | 8.6 | 86 | 71-135 |
| 2706-90-3 | Perfluoropentanoic acid | 10 | 8.5 | 85 | 69-132 |
| 307-24-4 | Perfluorohexanoic acid | 10 | 8.2 | 82 | 70-132 |
| 375-85-9 | Perfluoroheptanoic acid | 10 | 9.2 | 92 | 71-131 |
| 335-67-1 | Perfluorooctanoic acid | 10 | 9.1 | 91 | 69-133 |
| 375-95-1 | Perfluorononanoic acid | 10 | 8.8 | 88 | 72-129 |
| 335-76-2 | Perfluorodecanoic acid | 10 | 8.2 | 82 | 69-133 |
| 2058-94-8 | Perfluoroundecanoic acid | 10 | 8.9 | 89 | 64-136 |
| 307-55-1 | Perfluorododecanoic acid | 10 | 8.8 | 88 | 69-135 |
| 72629-94-8 | Perfluorotridecanoic acid | 10 | 9.2 | 92 | 66-139 |
| 376-06-7 | Perfluorotetradecanoic acid | 10 | 8.9 | 89 | 69-133 |
| 375-73-5 | Perfluorobutanesulfonic acid | 10 | 8.9 | 89 | 72-128 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 10 | 8.5 | 85 | 73-123 |
| 355-46-4 | Perfluorohexanesulfonic acid | 10 | 8.1 | 81 | 67-130 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 10 | 8.6 | 86 | 70-132 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 10 | 8.7 | 87 | 67-136 |
| 68259-12-1 | Perfluorononanesulfonic acid | 10 | 8.5 | 85 | 69-125 |
| 335-77-3 | Perfluorodecanesulfonic acid | 10 | 9.1 | 91 | 59-134 |
| 754-91-6 | PFOSA | 10 | 9.2 | 92 | 67-137 |
| 2355-31-9 | MeFOSAA | 10 | 8.8 | 88 | 63-144 |
| 2991-50-6 | EtFOSAA | 10 | 8.9 | 89 | 61-139 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 10 | 8.9 | 89 | 62-145 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 10 | 8.9 | 89 | 64-140 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 10 | 9.0 | 90 | 65-137 |

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C4-PFBA | 86% | 50-150% |
| | 13C5-PFPeA | 82% | 50-150% |
| | 13C5-PFHxA | 82% | 50-150% |
| | 13C4-PFHpA | 79% | 50-150% |
| | 13C8-PFOA | 83% | 50-150% |
| | 13C9-PFNA | 82% | 50-150% |
| | 13C6-PFDA | 85% | 50-150% |
| | 13C7-PFUnDA | 84% | 50-150% |

* = Outside of Control Limits.

# Blank Spike Summary



**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81642-BS | 2Q52957.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 86% | 50-150% |
| | 13C2-PFTeDA | 81% | 50-150% |
| | 13C3-PFBS | 83% | 50-150% |
| | 13C3-PFHxS | 86% | 50-150% |
| | 13C8-PFOS | 84% | 50-150% |
| | 13C8-FOSA | 86% | 50-150% |
| | d3-MeFOSAA | 85% | 50-150% |
| | 13C2-4:2FTS | 79% | 50-150% |
| | 13C2-6:2FTS | 83% | 50-150% |
| | 13C2-8:2FTS | 83% | 50-150% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81642-MS | 2Q52960.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |
| OP81642-MSD | 2Q52961.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |
| FA77936-1 | 2Q52959.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | Compound | FA77936-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | Spike ug/kg | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 0.96 U | | 9.34 | 8.8 | 94 | 9.22 | 8.6 | 93 | 2 | 71-135/30 |
| 2706-90-3 | Perfluoropentanoic acid | 0.27 | J | 9.34 | 9.0 | 93 | 9.22 | 8.8 | 93 | 2 | 69-132/30 |
| 307-24-4 | Perfluorohexanoic acid | 0.30 | J | 9.34 | 8.7 | 90 | 9.22 | 8.5 | 89 | 2 | 70-132/30 |
| 375-85-9 | Perfluoroheptanoic acid | 0.96 U | | 9.34 | 9.5 | 102 | 9.22 | 9.3 | 101 | 2 | 71-131/30 |
| 335-67-1 | Perfluorooctanoic acid | 0.55 | J | 9.34 | 9.9 | 100 | 9.22 | 9.5 | 97 | 4 | 69-133/30 |
| 375-95-1 | Perfluorononanoic acid | 0.96 U | | 9.34 | 9.1 | 97 | 9.22 | 8.8 | 95 | 3 | 72-129/30 |
| 335-76-2 | Perfluorodecanoic acid | 0.96 U | | 9.34 | 8.5 | 91 | 9.22 | 8.2 | 89 | 4 | 69-133/30 |
| 2058-94-8 | Perfluoroundecanoic acid | 0.96 U | | 9.34 | 9.0 | 96 | 9.22 | 8.7 | 94 | 3 | 64-136/30 |
| 307-55-1 | Perfluorododecanoic acid | 0.96 U | | 9.34 | 9.1 | 97 | 9.22 | 8.8 | 95 | 3 | 69-135/30 |
| 72629-94-8 | Perfluorotridecanoic acid | 0.96 U | | 9.34 | 9.8 | 105 | 9.22 | 9.7 | 105 | 1 | 66-139/30 |
| 376-06-7 | Perfluorotetradecanoic acid | 0.96 U | | 9.34 | 9.1 | 97 | 9.22 | 8.7 | 94 | 4 | 69-133/30 |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.96 U | | 9.34 | 9.1 | 97 | 9.22 | 8.9 | 97 | 2 | 72-128/30 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.96 U | | 9.34 | 8.9 | 95 | 9.22 | 8.6 | 93 | 3 | 73-123/30 |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.78 | J | 9.34 | 8.9 | 87 | 9.22 | 8.8 | 87 | 1 | 67-130/30 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.96 U | | 9.34 | 8.7 | 93 | 9.22 | 8.6 | 93 | 1 | 70-132/30 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 4.3 | | 9.34 | 12.7 | 90 | 9.22 | 12.4 | 88 | 2 | 67-136/30 |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.96 U | | 9.34 | 8.8 | 94 | 9.22 | 8.5 | 92 | 3 | 69-125/30 |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.96 U | | 9.34 | 9.2 | 98 | 9.22 | 9.1 | 99 | 1 | 59-134/30 |
| 754-91-6 | PFOSA | 0.96 U | | 9.34 | 9.4 | 101 | 9.22 | 8.9 | 97 | 5 | 67-137/30 |
| 2355-31-9 | MeFOSAA | 2.4 U | | 9.34 | 9.0 | 96 | 9.22 | 8.6 | 93 | 5 | 63-144/30 |
| 2991-50-6 | EtFOSAA | 2.4 U | | 9.34 | 9.8 | 105 | 9.22 | 9.6 | 104 | 2 | 61-139/30 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.96 U | | 9.34 | 9.0 | 96 | 9.22 | 8.8 | 95 | 2 | 62-145/30 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.96 U | | 9.34 | 9.2 | 98 | 9.22 | 9.0 | 98 | 2 | 64-140/30 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.96 U | | 9.34 | 9.0 | 96 | 9.22 | 8.8 | 95 | 2 | 65-137/30 |

| CAS No. | ID Standard Recoveries | MS | MSD | FA77936-1 | Limits |
|---|---|---|---|---|---|
| | 13C4-PFBA | 81% | 82% | | 50-150% |
| | 13C5-PFPeA | 78% | 78% | | 50-150% |
| | 13C5-PFHxA | 78% | 78% | 78% | 50-150% |
| | 13C4-PFHpA | 76% | 76% | 76% | 50-150% |
| | 13C8-PFOA | 78% | 79% | 79% | 50-150% |
| | 13C9-PFNA | 78% | 78% | 78% | 50-150% |
| | 13C6-PFDA | 81% | 82% | 82% | 50-150% |
| | 13C7-PFUnDA | 81% | 82% | 82% | 50-150% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** FA77711
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204046

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81642-MS | 2Q52960.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |
| OP81642-MSD | 2Q52961.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |
| FA77936-1 | 2Q52959.D | 1 | 08/23/20 | NAF | 08/20/20 | OP81642 | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77711-1, FA77711-2, FA77711-3, FA77711-4, FA77711-5, FA77711-6, FA77711-7, FA77711-8, FA77711-9, FA77711-10, FA77711-11, FA77711-12

| CAS No. | ID Standard Recoveries | MS | MSD | FA77936-1 | Limits |
|---|---|---|---|---|---|
| | 13C2-PFDoDA | 81% | 82% | 81% | 50-150% |
| | 13C2-PFTeDA | 71% | 71% | 71% | 50-150% |
| | 13C3-PFBS | 78% | 79% | 79% | 50-150% |
| | 13C3-PFHxS | 84% | 83% | 83% | 50-150% |
| | 13C8-PFOS | 80% | 80% | 81% | 50-150% |
| | 13C8-FOSA | 80% | 82% | | 50-150% |
| | d3-MeFOSAA | 73% | 76% | 73% | 50-150% |
| | 13C2-4:2FTS | 76% | 76% | | 50-150% |
| | 13C2-6:2FTS | 80% | 80% | | 50-150% |
| | 13C2-8:2FTS | 80% | 81% | | 50-150% |
| | 13C3-HFPO-DA | | | 82% | 50-150% |



* = Outside of Control Limits.

## Laboratory Report of Analysis

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501

Report Number: **1204074**

Client Project: **20-2176 CRW Postmark Bog V2**

Dear Kyle Wiseman,

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 ten 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 Chuck 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.

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

## Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1204074**
Project Name/Site: **20-2176 CRW Postmark Bog V2**
Project Contact: **Kyle Wiseman**

Refer to sample receipt form for information on sample condition.

**T1-07A (1204074001) PS**

EPA 537 PFAS was analyzed by SGS of Orlando, FL.
AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. The sample was analyzed twice and results confirm.

**LCS for HBN 1810653 [XXX/43711 (1576258) LCS**

AK102- Surrogate recovery in the LCS for 5a androstane does not meet QC criteria; however, the surrogate recoveries in the samples are within criteria.

**1204046001MS (1574910) MS**

9060A - Total Organic Carbon - MS recovery is outside of QC criteria. Refer to LCS for accuracy requirements.

*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. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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/CVA/CVB | Continuing Calibration Verification |
| CCCV/CVC/CVCA/CVCB | Closing Continuing Calibration Verification |
| CL | Control Limit |
| DF | Analytical Dilution Factor |
| DL | Detection Limit (i.e., maximum method detection limit) |
| E | The analyte result is above the calibrated range. |
| GT | Greater Than |
| IB | Instrument Blank |
| ICV | Initial Calibration Verification |
| J | The quantitation is an estimation. |
| LCS(D) | Laboratory Control Spike (Duplicate) |
| LLQC/LLIQC | Low Level Quantitation Check |
| 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 |
| MB | Method Blank |
| MS(D) | Matrix Spike (Duplicate) |
| ND | Indicates the analyte is not detected. |
| RPD | Relative Percent Difference |
| TNTC | Too Numerous To Count |
| 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 |
|---|---|---|---|---|
| T1-07A | 1204074001 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |
| T1-07B | 1204074002 | 08/10/2020 | 08/10/2020 | Solid/Soil (Wet Weight) |
| T1-23A | 1204074003 | 08/10/2020 | 08/10/2020 | Solid/Soil (Wet Weight) |
| T1-23B | 1204074004 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |
| T1-27A | 1204074005 | 08/10/2020 | 08/10/2020 | Solid/Soil (Wet Weight) |
| T1-27B | 1204074006 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |
| T1-39A | 1204074007 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |
| T1-39B | 1204074008 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |
| T1-XXX | 1204074009 | 08/10/2020 | 08/10/2020 | Solid/Soil (Wet Weight) |
| T1-XXXX | 1204074010 | 08/10/2020 | 08/10/2020 | Solid/Soil (Wet Weight) |
| T1-YY | 1204074011 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |
| Trip Blank | 1204074012 | 08/10/2020 | 08/10/2020 | Soil/Solid (dry weight) |

| Method | Method Description |
|---|---|
| AK101 | AK101/8021 Combo. (S) |
| SW8021B | AK101/8021 Combo. (S) |
| AK102 | Diesel/Residual Range Organics |
| AK103 | Diesel/Residual Range Organics |
| SM21 2540G | Percent Solids SM2540G |
| SW9060A-Mod | Total Organic Carbon-M in Soil |





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## Detectable Results Summary

Client Sample ID: **T1-07A**
Lab Sample ID: 1204074001

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 797 | mg/kg |
| | Residual Range Organics | 13600 | mg/kg |
| **Volatile Fuels** | Gasoline Range Organics | 22.8J | mg/Kg |
| | Toluene | 2160 | ug/kg |
| **Waters Department** | Total Organic Carbon | 37.9 | % |

Client Sample ID: **T1-23B**
Lab Sample ID: 1204074004

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 766 | mg/kg |
| | Residual Range Organics | 14900 | mg/kg |
| **Waters Department** | Total Organic Carbon | 34.9 | % |

Client Sample ID: **T1-27B**
Lab Sample ID: 1204074006

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 642 | mg/kg |
| | Residual Range Organics | 8110 | mg/kg |
| **Waters Department** | Total Organic Carbon | 45.1 | % |

Client Sample ID: **T1-39A**
Lab Sample ID: 1204074007

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 760 | mg/kg |
| | Residual Range Organics | 8710 | mg/kg |
| **Volatile Fuels** | Gasoline Range Organics | 15.1J | mg/Kg |
| | Toluene | 1430 | ug/kg |
| **Waters Department** | Total Organic Carbon | 37.1 | % |

Client Sample ID: **T1-YY**
Lab Sample ID: 1204074011

| | Parameter | Result | Units |
|---|---|---|---|
| **Semivolatile Organic Fuels** | Diesel Range Organics | 1250 | mg/kg |
| | Residual Range Organics | 14900 | mg/kg |
| **Volatile Fuels** | Gasoline Range Organics | 14.8J | mg/Kg |
| | Toluene | 971 | ug/kg |
| **Waters Department** | Total Organic Carbon | 41.8 | % |





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Results of **T1-07A**

Client Sample ID: **T1-07A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074001
Lab Project ID: 1204074

Collection Date: 08/10/20 11:35
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):20.3
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 797 | 98.0 | 30.4 | mg/kg | 1 | | 08/31/20 08:56 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 110 | 50-150 | | % | 1 | | 08/31/20 08:56 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 08:56
Container ID: 1204074001-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.203 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 13600 | 490 | 211 | mg/kg | 1 | | 08/31/20 08:56 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 95.9 | 50-150 | | % | 1 | | 08/31/20 08:56 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 08:56
Container ID: 1204074001-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.203 g
Prep Extract Vol: 5 mL





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## Results of **T1-07A**

Client Sample ID: **T1-07A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074001
Lab Project ID: 1204074

Collection Date: 08/10/20 11:35
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):20.3
Location:

## Results by **Volatile Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 22.8 | J | 51.9 | 15.6 | mg/Kg | 1 | | 08/14/20 17:25 |

**Surrogates**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| 4-Bromofluorobenzene (surr) | 46.3 | * | 50-150 | | % | 1 | | 08/14/20 17:25 |

### Batch Information

Analytical Batch: VFC15285
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/14/20 17:25
Container ID: 1204074001-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 11:35
Prep Initial Wt./Vol.: 19.144 g
Prep Extract Vol: 40.2636 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | 130 | U | 259 | 83.0 | ug/kg | 1 | | 08/14/20 17:25 |
| Ethylbenzene | 260 | U | 519 | 162 | ug/kg | 1 | | 08/14/20 17:25 |
| o-Xylene | 260 | U | 519 | 162 | ug/kg | 1 | | 08/14/20 17:25 |
| P & M -Xylene | 520 | U | 1040 | 311 | ug/kg | 1 | | 08/14/20 17:25 |
| Toluene | 2160 | | 519 | 162 | ug/kg | 1 | | 08/14/20 17:25 |
| Xylenes (total) | 780 | U | 1560 | 473 | ug/kg | 1 | | 08/14/20 17:25 |

**Surrogates**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| 1,4-Difluorobenzene (surr) | 93.1 | | 72-119 | | % | 1 | | 08/14/20 17:25 |

### Batch Information

Analytical Batch: VFC15285
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/14/20 17:25
Container ID: 1204074001-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 11:35
Prep Initial Wt./Vol.: 19.144 g
Prep Extract Vol: 40.2636 mL





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Results of **T1-07A**

Client Sample ID: **T1-07A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074001
Lab Project ID: 1204074

Collection Date: 08/10/20 11:35
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):20.3
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 37.9 | 2.47 | 0.742 | % | 1 | | 08/15/20 14:18 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 14:18
Container ID: 1204074001-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 49.9 mg
Prep Extract Vol: 1 mL





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## Results of **T1-23B**

Client Sample ID: **T1-23B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074004
Lab Project ID: 1204074

Collection Date: 08/10/20 11:00
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):22.2
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 766 | 89.5 | 27.7 | mg/kg | 1 | | 08/31/20 09:16 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 108 | 50-150 | | % | 1 | | 08/31/20 09:16 |

### Batch Information

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 09:16
Container ID: 1204074004-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.223 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 14900 | 447 | 192 | mg/kg | 1 | | 08/31/20 09:16 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 86 | 50-150 | | % | 1 | | 08/31/20 09:16 |

### Batch Information

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 09:16
Container ID: 1204074004-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.223 g
Prep Extract Vol: 5 mL





J flagging is activated

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Results of **T1-23B**

Client Sample ID: **T1-23B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074004
Lab Project ID: 1204074

Collection Date: 08/10/20 11:00
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):22.2
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 41.4 U | 82.8 | 24.8 | mg/Kg | 1 | | 08/14/20 16:31 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 126 | 50-150 | | % | 1 | | 08/14/20 16:31 |

**Batch Information**

Analytical Batch: VFC15285
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/14/20 16:31
Container ID: 1204074004-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 11:00
Prep Initial Wt./Vol.: 17.276 g
Prep Extract Vol: 63.4439 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 207 U | 414 | 132 | ug/kg | 1 | | 08/14/20 16:31 |
| Ethylbenzene | 414 U | 828 | 258 | ug/kg | 1 | | 08/14/20 16:31 |
| o-Xylene | 414 U | 828 | 258 | ug/kg | 1 | | 08/14/20 16:31 |
| P & M -Xylene | 830 U | 1660 | 497 | ug/kg | 1 | | 08/14/20 16:31 |
| Toluene | 414 U | 828 | 258 | ug/kg | 1 | | 08/14/20 16:31 |
| Xylenes (total) | 1240 U | 2480 | 755 | ug/kg | 1 | | 08/14/20 16:31 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 93.9 | 72-119 | | % | 1 | | 08/14/20 16:31 |

**Batch Information**

Analytical Batch: VFC15285
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/14/20 16:31
Container ID: 1204074004-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 11:00
Prep Initial Wt./Vol.: 17.276 g
Prep Extract Vol: 63.4439 mL



Print Date: 09/03/2020 9:48:07AM

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## Results of **T1-23B**

Client Sample ID: **T1-23B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074004
Lab Project ID: 1204074

Collection Date: 08/10/20 11:00
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):22.2
Location:

## Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 34.9 | 1.55 | 0.466 | % | 1 | | 08/15/20 14:25 |

### Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 14:25
Container ID: 1204074004-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 72.6 mg
Prep Extract Vol: 1 mL





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Results of **T1-27B**

Client Sample ID: **T1-27B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074006
Lab Project ID: 1204074

Collection Date: 08/10/20 10:00
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):15.9
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 642 | 125 | 38.7 | mg/kg | 1 | | 08/31/20 21:16 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 98.1 | 50-150 | | % | 1 | | 08/31/20 21:16 |

**Batch Information**

Analytical Batch: XFC15712
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 21:16
Container ID: 1204074006-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.182 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 8110 | 625 | 269 | mg/kg | 1 | | 08/31/20 21:16 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 85 | 50-150 | | % | 1 | | 08/31/20 21:16 |

**Batch Information**

Analytical Batch: XFC15712
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 21:16
Container ID: 1204074006-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.182 g
Prep Extract Vol: 5 mL





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Results of **T1-27B**

Client Sample ID: **T1-27B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074006
Lab Project ID: 1204074

Collection Date: 08/10/20 10:00
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):15.9
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 46.4 U | 92.8 | 27.8 | mg/Kg | 1 | | 08/14/20 16:13 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 51.7 | 50-150 | | % | 1 | | 08/14/20 16:13 |

**Batch Information**

Analytical Batch: VFC15285
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/14/20 16:13
Container ID: 1204074006-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 10:00
Prep Initial Wt./Vol.: 11.838 g
Prep Extract Vol: 34.9551 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 232 U | 464 | 149 | ug/kg | 1 | | 08/14/20 16:13 |
| Ethylbenzene | 464 U | 928 | 290 | ug/kg | 1 | | 08/14/20 16:13 |
| o-Xylene | 464 U | 928 | 290 | ug/kg | 1 | | 08/14/20 16:13 |
| P & M -Xylene | 930 U | 1860 | 557 | ug/kg | 1 | | 08/14/20 16:13 |
| Toluene | 464 U | 928 | 290 | ug/kg | 1 | | 08/14/20 16:13 |
| Xylenes (total) | 1390 U | 2780 | 847 | ug/kg | 1 | | 08/14/20 16:13 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 93.8 | 72-119 | | % | 1 | | 08/14/20 16:13 |

**Batch Information**

Analytical Batch: VFC15285
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/14/20 16:13
Container ID: 1204074006-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 10:00
Prep Initial Wt./Vol.: 11.838 g
Prep Extract Vol: 34.9551 mL





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## Results of **T1-27B**

Client Sample ID: **T1-27B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074006
Lab Project ID: 1204074

Collection Date: 08/10/20 10:00
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):15.9
Location:

## Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 45.1 | 3.46 | 1.04 | % | 1 | | 08/15/20 15:20 |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 15:20
Container ID: 1204074006-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 45.4 mg
Prep Extract Vol: 1 mL





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## Results of **T1-39A**

Client Sample ID: **T1-39A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074007
Lab Project ID: 1204074

Collection Date: 08/10/20 13:35
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):19.1
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 760 | 105 | 32.5 | mg/kg | 1 | | 08/31/20 21:26 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 106 | 50-150 | | % | 1 | | 08/31/20 21:26 |

### Batch Information

Analytical Batch: XFC15712
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 21:26
Container ID: 1204074007-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.017 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 8710 | 524 | 225 | mg/kg | 1 | | 08/31/20 21:26 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 95.2 | 50-150 | | % | 1 | | 08/31/20 21:26 |

### Batch Information

Analytical Batch: XFC15712
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 21:26
Container ID: 1204074007-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.017 g
Prep Extract Vol: 5 mL





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## Results of T1-39A

Client Sample ID: **T1-39A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074007
Lab Project ID: 1204074

Collection Date: 08/10/20 13:35
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):19.1
Location:

## Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 15.1 J | 47.6 | 14.3 | mg/Kg | 1 | | 08/14/20 15:54 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 59.9 | 50-150 | | % | 1 | | 08/14/20 15:54 |

### Batch Information

Analytical Batch: VFC15285
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/14/20 15:54
Container ID: 1204074007-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 13:35
Prep Initial Wt./Vol.: 24.784 g
Prep Extract Vol: 45.0526 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 119 U | 238 | 76.2 | ug/kg | 1 | | 08/14/20 15:54 |
| Ethylbenzene | 238 U | 476 | 149 | ug/kg | 1 | | 08/14/20 15:54 |
| o-Xylene | 238 U | 476 | 149 | ug/kg | 1 | | 08/14/20 15:54 |
| P & M -Xylene | 476 U | 952 | 286 | ug/kg | 1 | | 08/14/20 15:54 |
| Toluene | 1430 | 476 | 149 | ug/kg | 1 | | 08/14/20 15:54 |
| Xylenes (total) | 715 U | 1430 | 434 | ug/kg | 1 | | 08/14/20 15:54 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 93.2 | 72-119 | | % | 1 | | 08/14/20 15:54 |

### Batch Information

Analytical Batch: VFC15285
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/14/20 15:54
Container ID: 1204074007-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 13:35
Prep Initial Wt./Vol.: 24.784 g
Prep Extract Vol: 45.0526 mL



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Results of **T1-39A**

Client Sample ID: **T1-39A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074007
Lab Project ID: 1204074

Collection Date: 08/10/20 13:35
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):19.1
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 37.1 | 2.35 | 0.705 | % | 1 | | 08/15/20 15:35 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 15:35
Container ID: 1204074007-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 55.7 mg
Prep Extract Vol: 1 mL





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## Results of T1-YY

Client Sample ID: **T1-YY**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074011
Lab Project ID: 1204074

Collection Date: 08/10/20 13:40
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):21.7
Location:

## Results by **Semivolatile Organic Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 1250 | | 92.0 | 28.5 | mg/kg | 1 | | 08/31/20 21:36 |
| **Surrogates** | | | | | | | | |
| 5a Androstane (surr) | 142 | | 50-150 | | % | 1 | | 08/31/20 21:36 |

### Batch Information

Analytical Batch: XFC15712
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 21:36
Container ID: 1204074011-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.033 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 14900 | | 460 | 198 | mg/kg | 1 | | 08/31/20 21:36 |
| **Surrogates** | | | | | | | | |
| n-Triacontane-d62 (surr) | 77.2 | | 50-150 | | % | 1 | | 08/31/20 21:36 |

### Batch Information

Analytical Batch: XFC15712
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 21:36
Container ID: 1204074011-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.033 g
Prep Extract Vol: 5 mL





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Results of **T1-YY**

Client Sample ID: **T1-YY**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074011
Lab Project ID: 1204074

Collection Date: 08/10/20 13:40
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):21.7
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 14.8 J | 45.4 | 13.6 | mg/Kg | 1 | | 08/14/20 15:36 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 59 | 50-150 | | % | 1 | | 08/14/20 15:36 |

**Batch Information**

Analytical Batch: VFC15285
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/14/20 15:36
Container ID: 1204074011-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 13:40
Prep Initial Wt./Vol.: 21.038 g
Prep Extract Vol: 41.4692 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 114 U | 227 | 72.6 | ug/kg | 1 | | 08/14/20 15:36 |
| Ethylbenzene | 227 U | 454 | 142 | ug/kg | 1 | | 08/14/20 15:36 |
| o-Xylene | 227 U | 454 | 142 | ug/kg | 1 | | 08/14/20 15:36 |
| P & M -Xylene | 454 U | 908 | 272 | ug/kg | 1 | | 08/14/20 15:36 |
| Toluene | 971 | 454 | 142 | ug/kg | 1 | | 08/14/20 15:36 |
| Xylenes (total) | 680 U | 1360 | 414 | ug/kg | 1 | | 08/14/20 15:36 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.6 | 72-119 | | % | 1 | | 08/14/20 15:36 |

**Batch Information**

Analytical Batch: VFC15285
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/14/20 15:36
Container ID: 1204074011-B

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 13:40
Prep Initial Wt./Vol.: 21.038 g
Prep Extract Vol: 41.4692 mL





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Results of **T1-YY**

Client Sample ID: **T1-YY**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074011
Lab Project ID: 1204074

Collection Date: 08/10/20 13:40
Received Date: 08/10/20 16:15
Matrix: Soil/Solid (dry weight)
Solids (%):21.7
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 41.8 | 1.90 | 0.569 | % | 1 | | 08/15/20 15:43 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 15:43
Container ID: 1204074011-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 60.7 mg
Prep Extract Vol: 1 mL

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## Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204074012
Lab Project ID: 1204074

Collection Date: 08/10/20 09:15
Received Date: 08/10/20 16:15
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 | 1.25 U | 2.51 | 0.753 | mg/Kg | 1 | | 08/14/20 14:24 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 113 | 50-150 | | % | 1 | | 08/14/20 14:24 |

### Batch Information

Analytical Batch: VFC15285
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/14/20 14:24
Container ID: 1204074012-A

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 09:15
Prep Initial Wt./Vol.: 49.829 g
Prep Extract Vol: 25 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 6.25 U | 12.5 | 4.01 | ug/kg | 1 | | 08/14/20 14:24 |
| Ethylbenzene | 12.6 U | 25.1 | 7.83 | ug/kg | 1 | | 08/14/20 14:24 |
| o-Xylene | 12.6 U | 25.1 | 7.83 | ug/kg | 1 | | 08/14/20 14:24 |
| P & M -Xylene | 25.1 U | 50.2 | 15.1 | ug/kg | 1 | | 08/14/20 14:24 |
| Toluene | 12.6 U | 25.1 | 7.83 | ug/kg | 1 | | 08/14/20 14:24 |
| Xylenes (total) | 37.6 U | 75.3 | 22.9 | ug/kg | 1 | | 08/14/20 14:24 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 93.6 | 72-119 | | % | 1 | | 08/14/20 14:24 |

### Batch Information

Analytical Batch: VFC15285
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/14/20 14:24
Container ID: 1204074012-A

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 08/10/20 09:15
Prep Initial Wt./Vol.: 49.829 g
Prep Extract Vol: 25 mL





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## Method Blank

Blank ID: MB for HBN 1810629 [SPT/11109]
Blank Lab ID: 1576181

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074003, 1204074004, 1204074006, 1204074007, 1204074008, 1204074011

## Results by **SM21 2540G**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Solids | 100 | | | % |

## Batch Information

Analytical Batch: SPT11109
Analytical Method: SM21 2540G
Instrument:
Analyst: EBH
Analytical Date/Time: 8/20/2020 6:37:00PM



Print Date: 09/03/2020 9:48:10AM

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## Method Blank

Blank ID: MB for HBN 1810341 [VXX/36127]
Blank Lab ID: 1574843

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074004, 1204074006, 1204074007, 1204074011, 1204074012

## Results by **AK101**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Gasoline Range Organics | 1.25U | 2.50 | 0.750 | mg/Kg |
| **Surrogates** | | | | |
| 4-Bromofluorobenzene (surr) | 80.1 | 50-150 | | % |

## Batch Information

Analytical Batch: VFC15285
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/14/2020 2:06:00PM

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 8/14/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204074 [VXX36127]
Blank Spike Lab ID: 1574846
Date Analyzed: 08/14/2020 21:38

Spike Duplicate ID: LCSD for HBN 1204074 [VXX36127]
Spike Duplicate Lab ID: 1574847
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011, 1204074012

## 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 | 12.5 | 14.6 | 117 | 12.5 | 14.6 | 117 | ( 60-120 ) | 0.28 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 1.25 | 89 | 89 | 1.25 | 88.2 | 88 | ( 50-150 ) | 0.88 | |

## Batch Information

Analytical Batch: **VFC15285**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36127**
Prep Method: **SW5035A**
Prep Date/Time: **08/14/2020 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

## Method Blank

Blank ID: MB for HBN 1810341 [VXX/36127]
Blank Lab ID: 1574843

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074004, 1204074006, 1204074007, 1204074011, 1204074012

## Results by **SW8021B**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Benzene | 6.25U | 12.5 | 4.00 | ug/kg |
| Ethylbenzene | 12.5U | 25.0 | 7.80 | ug/kg |
| o-Xylene | 12.5U | 25.0 | 7.80 | ug/kg |
| P & M -Xylene | 25.0U | 50.0 | 15.0 | ug/kg |
| Toluene | 12.5U | 25.0 | 7.80 | ug/kg |
| Xylenes (total) | 37.5U | 75.0 | 22.8 | ug/kg |
| **Surrogates** | | | | |
| 1,4-Difluorobenzene (surr) | 97.9 | 72-119 | | % |

## Batch Information

Analytical Batch: VFC15285
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/14/2020 2:06:00PM

Prep Batch: VXX36127
Prep Method: SW5035A
Prep Date/Time: 8/14/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204074 [VXX36127]
Blank Spike Lab ID: 1574844
Date Analyzed: 08/14/2020 13:29

Spike Duplicate ID: LCSD for HBN 1204074 [VXX36127]
Spike Duplicate Lab ID: 1574845
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011, 1204074012

## Results by **SW8021B**

| | Blank Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 1250 | 1330 | 107 | 1250 | 1320 | 106 | ( 75-125 ) | 0.66 | (< 20 ) |
| Ethylbenzene | 1250 | 1080 | 86 | 1250 | 1070 | 86 | ( 75-125 ) | 0.46 | (< 20 ) |
| o-Xylene | 1250 | 1070 | 86 | 1250 | 1060 | 85 | ( 75-125 ) | 0.70 | (< 20 ) |
| P & M -Xylene | 2500 | 2140 | 86 | 2500 | 2130 | 85 | ( 80-125 ) | 0.56 | (< 20 ) |
| Toluene | 1250 | 1190 | 95 | 1250 | 1150 | 92 | ( 70-125 ) | 3.40 | (< 20 ) |
| Xylenes (total) | 3750 | 3210 | 86 | 3750 | 3190 | 85 | ( 78-124 ) | 0.61 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 1250 | 102 | 102 | 1250 | 103 | 103 | ( 72-119 ) | 0.97 | |

## Batch Information

Analytical Batch: **VFC15285**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36127**
Prep Method: **SW5035A**
Prep Date/Time: **08/14/2020 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL





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## Matrix Spike Summary

Original Sample ID: 1575472
MS Sample ID: 1574848 MS
MSD Sample ID: 1574849 MSD

Analysis Date: 08/14/2020 16:31
Analysis Date: 08/14/2020 16:49
Analysis Date: 08/14/2020 17:07
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011, 1204074012

## Results by **SW8021B**

| | | Matrix Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 8.45U | 1690 | 1820 | 108 | 1690 | 1860 | 110 | 75-125 | 1.90 | (< 20 ) |
| Ethylbenzene | 16.9U | 1690 | 1530 | 91 | 1690 | 1560 | 93 | 75-125 | 1.70 | (< 20 ) |
| o-Xylene | 16.9U | 1690 | 1450 | 86 | 1690 | 1480 | 88 | 75-125 | 2.30 | (< 20 ) |
| P & M -Xylene | 33.8U | 3370 | 2980 | 88 | 3370 | 3050 | 90 | 80-125 | 2.20 | (< 20 ) |
| Toluene | 16.9U | 1690 | 1670 | 99 | 1690 | 1660 | 98 | 70-125 | 0.81 | (< 20 ) |
| Xylenes (total) | 50.5U | 5060 | 4430 | 88 | 5060 | 4530 | 90 | 78-124 | 2.30 | (< 20 ) |
| **Surrogates** | | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | | 1690 | 1640 | 97 | 1690 | 1640 | 97 | 72-119 | 0.04 | |

## Batch Information

Analytical Batch: VFC15285
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/14/2020 4:49:00PM

Prep Batch: VXX36127
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/14/2020 6:00:00AM
Prep Initial Wt./Vol.: 37.06g
Prep Extract Vol: 25.00mL





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**Method Blank**

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574906

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074004

Results by **SW9060A-Mod**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 11:06:25AM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL





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## Method Blank

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574911

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074004, 1204074006, 1204074007, 1204074011

## Results by **SW9060A-Mod**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 2:44:42PM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204074 [WXX13402]
Blank Spike Lab ID: 1574907
Date Analyzed: 08/15/2020 11:19

Spike Duplicate ID: LCSD for HBN 1204074 [WXX13402]
Spike Duplicate Lab ID: 1574908
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004

## Results by **SW9060A-Mod**

| Parameter | Blank Spike (%) Spike | Blank Spike (%) Result | Blank Spike (%) Rec (%) | Spike Duplicate (%) Spike | Spike Duplicate (%) Result | Spike Duplicate (%) Rec (%) | CL | RPD (%) | RPD CL |
|---|---|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 3.35 | 3.23 | 96 | 3.35 | 3.22 | 96 | ( 75-125 ) | 0.31 | (< 25 ) |

## Batch Information

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204074 [WXX13402]
Blank Spike Lab ID: 1574912
Date Analyzed: 08/15/2020 14:59

Spike Duplicate ID: LCSD for HBN 1204074 [WXX13402]
Spike Duplicate Lab ID: 1574913
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011

## Results by **SW9060A-Mod**

| | Blank Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 3.35 | 3.21 | 96 | 3.35 | 3.18 | 95 | ( 75-125 ) | 0.94 | (< 25 ) |

## Batch Information

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL





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## Matrix Spike Summary

Original Sample ID: 1204046001
MS Sample ID: 1574910 MS
MSD Sample ID:

Analysis Date: 08/15/2020 13:17
Analysis Date: 08/15/2020 13:26
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006

## Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 33.8 | 4.98 | 40.5 | 130 * | | | | 75-125 | | |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 1:26:17PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 71.80mg
Prep Extract Vol: 1.00mL

## Matrix Spike Summary

Original Sample ID: 1204074006
MS Sample ID: 1574914 MS
MSD Sample ID:

Analysis Date: 08/15/2020 15:20
Analysis Date: 08/15/2020 15:28
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011

## Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 45.1 | 14.1 | 57.0 | 85 | | | | 75-125 | | |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 3:28:50PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 44.70mg
Prep Extract Vol: 1.00mL





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## Method Blank

Blank ID: MB for HBN 1810653 [XXX/43711]
Blank Lab ID: 1576257

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074004, 1204074006, 1204074007, 1204074011

## Results by **AK102**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Diesel Range Organics | 10.0U | 20.0 | 6.20 | mg/kg |
| **Surrogates** | | | | |
| 5a Androstane (surr) | 106 | 60-120 | | % |

## Batch Information

Analytical Batch: XFC15711
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/31/2020 6:08:00AM

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 8/21/2020 1:45:08PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204074 [XXX43711]
Blank Spike Lab ID: 1576258
Date Analyzed: 08/31/2020 06:18

Spike Duplicate ID: LCSD for HBN 1204074 [XXX43711]
Spike Duplicate Lab ID: 1576259
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011

## 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 | 833 | 788 | 95 | 833 | 733 | 88 | ( 75-125 ) | 7.30 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 5a Androstane (surr) | 16.7 | 122 | 122 * | 16.7 | 113 | 113 | ( 60-120 ) | 8.10 | |

## Batch Information

Analytical Batch: **XFC15711**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43711**
Prep Method: **SW3550C**
Prep Date/Time: **08/21/2020 13:45**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL





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**Method Blank**

Blank ID: MB for HBN 1810653 [XXX/43711]
Blank Lab ID: 1576257

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204074001, 1204074004, 1204074006, 1204074007, 1204074011

Results by **AK103**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Residual Range Organics | 50.0U | 100 | 43.0 | mg/kg |
| **Surrogates** | | | | |
| n-Triacontane-d62 (surr) | 103 | 60-120 | | % |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/31/2020 6:08:00AM

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 8/21/2020 1:45:08PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204074 [XXX43711]
Blank Spike Lab ID: 1576258
Date Analyzed: 08/31/2020 06:18

Spike Duplicate ID: LCSD for HBN 1204074 [XXX43711]
Spike Duplicate Lab ID: 1576259
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204074001, 1204074004, 1204074006, 1204074007, 1204074011

## Results by **AK103**

| | Blank Spike (mg/kg) | | | Spike Duplicate (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Residual Range Organics | 833 | 763 | 92 | 833 | 705 | 85 | ( 60-120 ) | 7.90 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| n-Triacontane-d62 (surr) | 16.7 | 110 | 110 | 16.7 | 106 | 106 | ( 60-120 ) | 3.30 | |

## Batch Information

Analytical Batch: **XFC15711**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43711**
Prep Method: **SW3550C**
Prep Date/Time: **08/21/2020 13:45**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL





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Page 1 of 2

**Section 1**

CLIENT: RSE

CONTACT: Kyle Wiseman | PHONE #: 278-1023

PROJECT NAME: CRW Postmark Bog V2 | PROJECT/PWSID/PERMIT#: 20-2176

REPORTS TO: RSE | E-MAIL: kwiseman@restorsci.com

Profile #:

INVOICE TO: RSE | QUOTE #:

P.O. #: p# 364091 [illegible]

**Section 3** — Preservative

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

**Section 2**

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/ MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | PFAS | DRO/RRO | TOC | GRO/BTEX | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1AC | T1-07A | 8/10/2020 | 11:35 | SOIL | 3 | G | X | X | X | X | |
| 2AC | T1-07B | 8/10/2020 | 12:00 | SOIL | 3 | G | X | X | X | X | HOLD DRO, RRO, GRO TOC, BTEX |
| 3AC | T1-23A | 8/10/2020 | 10:40 | SOIL | 3 | G | X | X | X | X | HOLD DRO, RRO, GRO TOC, BTEX |
| 4AC | T1-23B | 8/10/2020 | 11:00 | SOIL | 3 | G | X | X | X | X | |
| 5AC | T1-27A | 8/10/2020 | 9:15 | SOIL | 3 | G | X | X | X | X | HOLD DRO, RRO, GRO, TOC, BTEX |
| 6AC | T1-27B | 8/10/2020 | 10:00 | SOIL | 3 | G | X | X | X | X | |
| 7AC | T1-39A | 8/10/2020 | 13:35 | SOIL | 3 | G | X | X | X | X | |
| 8AC | T1-39B | 8/10/2020 | 13:50 | SOIL | 3 | G | X | X | X | X | HOLD DRO, RRO, GRO TOC, BTEX |
| 9A | T1-XXX | 8/10/2020 | 9:20 | SOIL | 1 | G | X | | | | |
| 10A | T1-XXXX | 8/10/2020 | 13:45 | SOIL | 1 | G | X | | | | |

**Section 5**

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) [signature] | 8/10 | 1555 | |
| (2) | | | |
| (3) | | | |
| (4) | 8/10/20 | 1615 | Received For Laboratory By: [signature] |

**Section 4** DOD Project? Yes No

Cooler ID: 8/10

Data Deliverable Requirements: REGULAR

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 4.7 D58

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

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F083-Blank_COC_20181228

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CHAIN OF CUSTODY RECORD

1204074

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Omissions may ... ysis.

Page 2 of 2

| Section 1 | | | |
|---|---|---|---|
| CLIENT: RSE | | | |
| CONTACT: Kyle Wiseman | | PHONE #: 278-1023 | |
| PROJECT NAME: CRW Postmark Bog V2 | | PROJECT/ PWSID/ PERMIT#: 20-2176 | |
| REPORTS TO: RSE | | E-MAIL: kwiseman@restorsci.com | Profile #: |
| INVOICE TO: RSE | | QUOTE #: | P.O. #: |

Section 3 — Preservative

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/ MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | DRO/RRO | TOC | GRO/BTEX | | | | | | | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11AB | T7-YY | 8/10/2020 | 13:40 | SOIL | 2 | G | X | X | X | | | | | | | |
| 12A | | | | | | | | | | | | | | | | |

DRAFT

| Section 5 | Date | Time | Received By: |
|---|---|---|---|
| Relinquished By: (1) | 8/10 | 1555 | |
| Relinquished By: (2) | | | |
| Relinquished By: (3) | | | |
| Relinquished By: (4) | 8/10/20 | 1615 | Received For Laboratory By: MM |

Section 4 DOD Project? Yes No

Cooler ID: 8/10

Data Deliverable Requirements: REGULAR

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 4.7 D58

or Ambient [ ]

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

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F083-Blank_COC_20181228

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e-Sample Receipt Form

**SGS Workorder #:** **1204074**

| Review Criteria | Condition (Yes, No, N/A) | Exceptions Noted below |
|---|---|---|
| **Chain of Custody / Temperature Requirements** | Yes | Exemption permitted if sampler hand carries/delivers. |
| Were Custody Seals intact? Note # & location | N/A | Absent |
| COC accompanied samples? | Yes | |
| DOD: Were samples received in COC corresponding coolers? | N/A | |
| | N/A | **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required |
| Temperature blank compliant* (i.e., 0-6 °C after CF)? | Yes | Cooler ID: 10-Aug @ 4.7 °C Therm. ID: D58 |
| If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available. | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| *If >6°C, were samples collected <8 hours ago?* | N/A | |
| If <0°C, were sample containers ice free? | N/A | |
| Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed. | | |
| **Holding Time / Documentation / Sample Condition Requirements** | | Note: Refer to form F-083 "Sample Guide" for specific holding times. |
| Were samples received within holding time? | Yes | |
| Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information | Yes | |
| Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals) | Yes | |
| | N/A | ***Exemption permitted for metals (e.g,200.8/6020A). |
| Were proper containers (type/mass/volume/preservative***)used? | Yes | |
| **Volatile / LL-Hg Requirements** | | |
| Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? | Yes | |
| Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? | N/A | |
| Were all soil VOAs field extracted with MeOH+BFB? | Yes | |

**Note to Client:** Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

DRAFT

F102b_SRFpm_20190325

## Sample Containers and Preservatives

| Container Id | Preservative | Container Condition | Container Id | Preservative | Container Condition |
|---|---|---|---|---|---|
| 1204074001-A | No Preservative Required | OK | | | |
| 1204074001-B | Methanol field pres. 4 C | OK | | | |
| 1204074001-C | No Preservative Required | OK | | | |
| 1204074002-A | No Preservative Required | OK | | | |
| 1204074002-B | Methanol field pres. 4 C | OK | | | |
| 1204074002-C | No Preservative Required | OK | | | |
| 1204074003-A | No Preservative Required | OK | | | |
| 1204074003-B | Methanol field pres. 4 C | OK | | | |
| 1204074003-C | No Preservative Required | OK | | | |
| 1204074004-A | No Preservative Required | OK | | | |
| 1204074004-B | 2x Methanol field pres. 4 C | OK | | | |
| 1204074004-C | No Preservative Required | OK | | | |
| 1204074005-A | No Preservative Required | OK | | | |
| 1204074005-B | Methanol field pres. 4 C | OK | | | |
| 1204074005-C | No Preservative Required | OK | | | |
| 1204074006-A | No Preservative Required | OK | | | |
| 1204074006-B | Methanol field pres. 4 C | OK | | | |
| 1204074006-C | No Preservative Required | OK | | | |
| 1204074007-A | No Preservative Required | OK | | | |
| 1204074007-B | Methanol field pres. 4 C | OK | | | |
| 1204074007-C | No Preservative Required | OK | | | |
| 1204074008-A | No Preservative Required | OK | | | |
| 1204074008-B | Methanol field pres. 4 C | OK | | | |
| 1204074008-C | No Preservative Required | OK | | | |
| 1204074009-A | No Preservative Required | OK | | | |
| 1204074010-A | No Preservative Required | OK | | | |
| 1204074011-A | No Preservative Required | OK | | | |
| 1204074011-B | Methanol field pres. 4 C | OK | | | |
| 1204074012-A | Methanol field pres. 4 C | OK | | | |



Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*
*Automated Report*

# Technical Report for

## SGS North America, Inc

1204074

SGS Job Number: FA77709

Sampling Date: 08/10/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: **49**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV


Test results relate only to samples analyzed.

# Table of Contents

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# Sample Summary

SGS North America, Inc

1204074

**Job No:** FA77709

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| FA77709-1 | 08/10/20 | 11:35 | | 08/12/20 | SO | Soil | T1-07A |
| FA77709-2 | 08/10/20 | 12:00 | | 08/12/20 | SO | Soil | T1-07B |
| FA77709-3 | 08/10/20 | 10:40 | | 08/12/20 | SO | Soil | T1-23A |
| FA77709-4 | 08/10/20 | 11:00 | | 08/12/20 | SO | Soil | T1-23B |
| FA77709-5 | 08/10/20 | 09:15 | | 08/12/20 | SO | Soil | T1-27A |
| FA77709-6 | 08/10/20 | 10:00 | | 08/12/20 | SO | Soil | T1-27B |
| FA77709-7 | 08/10/20 | 13:35 | | 08/12/20 | SO | Soil | T1-39A |
| FA77709-8 | 08/10/20 | 13:50 | | 08/12/20 | SO | Soil | T1-39B |
| FA77709-9 | 08/10/20 | 09:20 | | 08/12/20 | SO | Soil | T1-XXX |
| FA77709-10 | 08/10/20 | 13:45 | | 08/12/20 | SO | Soil | T1-XXXX |



Soil samples reported on a dry weight basis unless otherwise indicated on result page.

# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** SGS North America, Inc  **Job No:** FA77709

**Site:** 1204074  **Report Date:** 8/25/2020 4:38:31 PM

10 Samples were collected on 08/10/2020 and were received at SGS North America Inc - Orlando on 08/12/2020 properly preserved, at 1.4 Deg. C and intact. These Samples received an SGS Orlando job number of FA77709. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO  **Batch ID:** OP81627

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA77769-4MS, FA77769-4MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Matrix Spike Recovery(s) for Perfluorooctanesulfonic acid are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Matrix Spike Duplicate Recovery(s) for Perfluorooctanesulfonic acid are outside control limits. Probable cause is due to matrix interference.

Sample(s) FA77709-1, FA77709-10, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8,

FA77709-1 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77709-1 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77709-1 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77709-1 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-1 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77709-2 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77709-2 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77709-2 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77709-2 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-3 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-3 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77709-3 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77709-3 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77709-3 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77709-4 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-4 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77709-4 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77709-4 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77709-4 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77709-4 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77709-5 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77709-5 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-5 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77709-5 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77709-5 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77709-5 for 13C9-PFNA: Outside control limits due to matrix interference.

OP81627-MS for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77709-6 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-6 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77709-6 for 13C7-PFUnDA: Outside control limits due to matrix interference.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81627 (cont.)

FA77709-6 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77709-6 for 13C8-PFOA: Outside control limits due to matrix interference.

FA77709-6 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77709-6 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77709-9 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77709-9 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77709-4 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77709-5 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77709-7 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77709-1: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-1 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77709-2: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-3: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-4: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-4 for PFOSA: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77709-5: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-5 for EtFOSAA: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77709-5 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77709-6: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-6 for PFOSA: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77709-6 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77709-7: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-7 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77709-7 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77709-8: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-8 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77709-8 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77709-9 have surrogates outside control limits.

FA77709-9: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-10: Dilution required due to matrix interference (ID recovery standard failure).

FA77709-10 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81627

FA77709-7 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77709-7 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77709-8 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77709-7 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77709-6 for 13C5-PFPeA: Outside control limits due to matrix interference.
FA77709-7 for 13C9-PFNA: Outside control limits due to matrix interference.
FA77709-6 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77709-8 for 13C2-4:2FTS: Outside control limits due to matrix interference.
FA77709-8 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77709-8 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77709-8 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77709-8 for 13C3-PFBS: Outside control limits due to matrix interference.
FA77709-8 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77709-8 for 13C5-PFHxA: Outside control limits due to matrix interference.
FA77709-8 for 13C5-PFPeA: Outside control limits due to matrix interference.
FA77709-8 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77709-8 for 13C7-PFUnDA: Outside control limits due to matrix interference.
OP81627-MSD for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77709-7 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77709-8 for 13C8-PFOA: Outside control limits due to matrix interference.
OP81627-MS for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77709-9 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77709-9 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77709-9 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77709-9 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77709-10 for 13C2-PFDoDA: Outside control limits due to matrix interference.
FA77709-10 for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77709-10 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77709-10 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77709-10 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77709-6 for 13C2-8:2FTS: Outside control limits due to matrix interference.
FA77709-10 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77709-6 for 13C6-PFDA: Outside control limits due to matrix interference.
OP81627-MS for 13C2-PFDoDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C2-PFTeDA: Outside control limits due to matrix interference.
FA77709-6 for 13C4-PFHpA: Outside control limits due to matrix interference.
FA77709-7 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77709-10 for 13C9-PFNA: Outside control limits due to matrix interference.
OP81627-MSD for 13C8-FOSA: Outside control limits due to matrix interference.
FA77709-8 for 13C8-FOSA: Outside control limits due to matrix interference.
OP81627-MSD for 13C6-PFDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C2-PFDoDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C2-8:2FTS: Outside control limits due to matrix interference.
OP81627-MS for d3-MeFOSAA: Outside control limits due to matrix interference.
OP81627-MS for 13C8-FOSA: Outside control limits due to matrix interference.
OP81627-MS for 13C7-PFUnDA: Outside control limits due to matrix interference.
OP81627-MS for 13C6-PFDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C7-PFUnDA: Outside control limits due to matrix interference.

## General Chemistry By Method SM19 2540G

**Matrix:** SO **Batch ID:** GN85929

Sample(s) FA77586-9DUP were used as the QC samples for Solids, Percent.

**Matrix:** SO **Batch ID:** GN85933

Sample(s) FA77717-1DUP were used as the QC samples for Solids, Percent.

RPD(s) for Duplicate for Solids, Percent are outside control limits for sample GN85933-D1. Probable cause is due to sample non-homogeneity.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

______________________________________

Jenna Kravitz, Client Services *(Signature on File)*

# Summary of Hits

**Job Number:** FA77709
**Account:** SGS North America, Inc
**Project:** 1204074
**Collected:** 08/10/20



| Lab Sample ID / Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| **FA77709-1** | **T1-07A** | | | | | |
| Perfluoropentanoic acid | | 0.0040 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0039 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0025 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0020 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-2** | **T1-07B** | | | | | |
| Perfluoropentanoic acid | | 0.0010 J | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0012 J | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-3** | **T1-23A** | | | | | |
| Perfluorobutanoic acid | | 0.0040 J | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0187 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0161 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0089 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0031 J | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0027 J | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0021 J | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0104 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0139 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0139 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-4** | **T1-23B** | | | | | |
| Perfluoropentanoic acid | | 0.0044 J | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0028 J | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0015 J | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0019 J | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-5** | **T1-27A** | | | | | |
| Perfluorobutanoic acid | | 0.0098 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | | 0.0313 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0472 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0198 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0141 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | | 0.0143 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | | 0.0134 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0882 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanesulfonic acid | | 0.0079 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.330 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | | 0.0658 | 0.0045 | 0.0023 | mg/kg | EPA 537M QSM5.3 B-15 |

# Summary of Hits

**Job Number:** FA77709
**Account:** SGS North America, Inc
**Project:** 1204074
**Collected:** 08/10/20



| Lab Sample ID Client Sample ID Analyte | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|
| **FA77709-6 T1-27B** | | | | | |
| Perfluorohexanesulfonic acid | 0.0056 | 0.0041 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | 0.0351 | 0.0041 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | 0.0030 J | 0.0041 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-7 T1-39A** | | | | | |
| Perfluorobutanoic acid | 0.0119 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | 0.0302 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | 0.0671 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | 0.0211 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | 0.0268 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | 0.0371 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | 0.0324 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | 0.263 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanesulfonic acid | 0.0151 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | 0.363 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | 0.215 | 0.0038 | 0.0019 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-8 T1-39B** | | | | | |
| Perfluorobutanoic acid | 0.0197 | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid [a] | 0.0298 J | 0.056 | 0.028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid [a] | 0.0427 J | 0.056 | 0.028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid [a] | 0.0283 J | 0.056 | 0.028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | 0.0450 | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanesulfonic acid | 0.0068 | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | 0.0951 | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | 0.0637 | 0.0056 | 0.0028 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-9 T1-XXX** | | | | | |
| Perfluorobutanoic acid | 0.0076 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | 0.0239 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | 0.0345 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | 0.0136 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | 0.0086 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanoic acid | 0.0023 J | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | 0.0103 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | 0.0092 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | 0.0552 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanesulfonic acid | 0.0047 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | 0.242 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |

# Summary of Hits

**Job Number:** FA77709
**Account:** SGS North America, Inc
**Project:** 1204074
**Collected:** 08/10/20



| Lab Sample ID Client Sample ID Analyte | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|
| 6:2 Fluorotelomer sulfonate | 0.0375 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77709-10 T1-XXXX** | | | | | |
| Perfluorobutanoic acid | 0.0138 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanoic acid | 0.0380 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | 0.0744 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | 0.0249 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | 0.0333 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorobutanesulfonic acid | 0.0361 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoropentanesulfonic acid | 0.0341 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | 0.289 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanesulfonic acid | 0.0298 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid [a] | 1.06 | 0.042 | 0.021 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanesulfonic acid | 0.0039 J | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| 6:2 Fluorotelomer sulfonate | 0.248 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |
| 8:2 Fluorotelomer sulfonate | 0.0089 | 0.0042 | 0.0021 | mg/kg | EPA 537M QSM5.3 B-15 |

(a) Dilution required due to matrix interference (ID recovery standard failure).

Report of Analysis

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-07A | | |
| **Lab Sample ID:** | FA77709-1 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 20.3 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5117.D | 1 | 08/21/20 19:03 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5068.D | 10 | 08/20/20 23:33 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.35 g | 1.0 ml |
| Run #2 | 2.35 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0040 | 0.0042 | 0.0021 | 0.00084 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0039 | 0.0042 | 0.0021 | 0.00084 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0025 | 0.0042 | 0.0021 | 0.0010 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0020 | 0.0042 | 0.0021 | 0.0010 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.010 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.010 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.010 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.010 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.010 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.021 U [b] | 0.042 | 0.021 | 0.010 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.042 U [b] | 0.10 | 0.042 | 0.021 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.042 U [b] | 0.10 | 0.042 | 0.021 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-07A | | |
| **Lab Sample ID:** | FA77709-1 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 20.3 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0021 U | 0.0042 | 0.0021 | 0.0010 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 63% | 76% | 50-150% |
| | 13C5-PFPeA | 56% | 75% | 50-150% |
| | 13C5-PFHxA | 57% | 77% | 50-150% |
| | 13C4-PFHpA | 56% | 77% | 50-150% |
| | 13C8-PFOA | 57% | 81% | 50-150% |
| | 13C9-PFNA | 50% | 76% | 50-150% |
| | 13C6-PFDA | 47% [c] | 74% | 50-150% |
| | 13C7-PFUnDA | 40% [c] | 66% | 50-150% |
| | 13C2-PFDoDA | 41% [c] | 67% | 50-150% |
| | 13C2-PFTeDA | 34% [c] | 66% | 50-150% |
| | 13C3-PFBS | 64% | 83% | 50-150% |
| | 13C3-PFHxS | 64% | 72% | 50-150% |
| | 13C8-PFOS | 63% | 76% | 50-150% |
| | 13C8-FOSA | 16% [c] | 54% | 50-150% |
| | d3-MeFOSAA | 49% [c] | 68% | 50-150% |
| | 13C2-4:2FTS | 58% | 74% | 50-150% |
| | 13C2-6:2FTS | 62% | 79% | 50-150% |
| | 13C2-8:2FTS | 56% | 77% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-07B | | |
| **Lab Sample ID:** | FA77709-2 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 18.5 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5118.D | 1 | 08/21/20 19:19 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5069.D | 10 | 08/20/20 23:49 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.39 g | 1.0 ml |
| Run #2 | 2.39 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0010 | 0.0045 | 0.0023 | 0.00090 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0012 | 0.0045 | 0.0023 | 0.00090 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0045 U | 0.011 | 0.0045 | 0.0023 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0045 U | 0.011 | 0.0045 | 0.0023 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-07B | | |
| **Lab Sample ID:** | FA77709-2 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 18.5 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 71% | 82% | 50-150% |
| | 13C5-PFPeA | 69% | 82% | 50-150% |
| | 13C5-PFHxA | 71% | 85% | 50-150% |
| | 13C4-PFHpA | 68% | 85% | 50-150% |
| | 13C8-PFOA | 69% | 90% | 50-150% |
| | 13C9-PFNA | 58% | 87% | 50-150% |
| | 13C6-PFDA | 49% [c] | 82% | 50-150% |
| | 13C7-PFUnDA | 45% [c] | 76% | 50-150% |
| | 13C2-PFDoDA | 48% [c] | 80% | 50-150% |
| | 13C2-PFTeDA | 55% | 85% | 50-150% |
| | 13C3-PFBS | 80% | 90% | 50-150% |
| | 13C3-PFHxS | 76% | 89% | 50-150% |
| | 13C8-PFOS | 70% | 85% | 50-150% |
| | 13C8-FOSA | 28% [c] | 75% | 50-150% |
| | d3-MeFOSAA | 53% | 76% | 50-150% |
| | 13C2-4:2FTS | 71% | 80% | 50-150% |
| | 13C2-6:2FTS | 72% | 85% | 50-150% |
| | 13C2-8:2FTS | 59% | 85% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.



U = Not detected　LOD = Limit of Detection　J = Indicates an estimated value
LOQ = Limit of Quantitation　DL = Detection Limit　B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range　N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-23A | | |
| **Lab Sample ID:** | FA77709-3 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 20.3 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5119.D | 1 | 08/21/20 19:34 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5070.D | 10 | 08/21/20 00:04 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.23 g | 1.0 ml |
| Run #2 | 2.23 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0040 | 0.0044 | 0.0022 | 0.0011 | mg/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | 0.0187 | 0.0044 | 0.0022 | 0.00088 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0161 | 0.0044 | 0.0022 | 0.00088 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0089 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0031 | 0.0044 | 0.0022 | 0.0011 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0027 | 0.0044 | 0.0022 | 0.0011 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0021 | 0.0044 | 0.0022 | 0.0011 | mg/kg | J |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0104 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0139 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0044 U | 0.011 | 0.0044 | 0.0022 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0044 U | 0.011 | 0.0044 | 0.0022 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0139 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-23A | | |
| **Lab Sample ID:** | FA77709-3 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 20.3 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 64% | 69% | 50-150% |
| | 13C5-PFPeA | 52% | 68% | 50-150% |
| | 13C5-PFHxA | 56% | 70% | 50-150% |
| | 13C4-PFHpA | 55% | 69% | 50-150% |
| | 13C8-PFOA | 58% | 75% | 50-150% |
| | 13C9-PFNA | 53% | 71% | 50-150% |
| | 13C6-PFDA | 44% [c] | 70% | 50-150% |
| | 13C7-PFUnDA | 45% [c] | 67% | 50-150% |
| | 13C2-PFDoDA | 45% [c] | 67% | 50-150% |
| | 13C2-PFTeDA | 40% [c] | 68% | 50-150% |
| | 13C3-PFBS | 64% | 77% | 50-150% |
| | 13C3-PFHxS | 64% | 73% | 50-150% |
| | 13C8-PFOS | 65% | 70% | 50-150% |
| | 13C8-FOSA | 19% [c] | 51% | 50-150% |
| | d3-MeFOSAA | 51% | 69% | 50-150% |
| | 13C2-4:2FTS | 58% | 67% | 50-150% |
| | 13C2-6:2FTS | 63% | 72% | 50-150% |
| | 13C2-8:2FTS | 54% | 71% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-23B | | | |
| **Lab Sample ID:** | FA77709-4 | | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 16.3 |
| **Project:** | 1204074 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5120.D | 1 | 08/21/20 19:50 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5071.D | 10 | 08/21/20 00:20 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.20 g | 1.0 ml |
| Run #2 | 2.20 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0044 | 0.0056 | 0.0028 | 0.0011 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0028 | 0.0056 | 0.0028 | 0.0011 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0015 | 0.0056 | 0.0028 | 0.0014 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0019 | 0.0056 | 0.0028 | 0.0014 | mg/kg | J |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.0056 U | 0.014 | 0.0056 | 0.0028 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.0056 U | 0.014 | 0.0056 | 0.0028 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis






| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-23B | | |
| **Lab Sample ID:** | FA77709-4 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.3 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 60% | 72% | 50-150% |
| | 13C5-PFPeA | 54% | 70% | 50-150% |
| | 13C5-PFHxA | 56% | 73% | 50-150% |
| | 13C4-PFHpA | 55% | 73% | 50-150% |
| | 13C8-PFOA | 55% | 76% | 50-150% |
| | 13C9-PFNA | 49% [d] | 72% | 50-150% |
| | 13C6-PFDA | 34% [d] | 69% | 50-150% |
| | 13C7-PFUnDA | 39% [d] | 61% | 50-150% |
| | 13C2-PFDoDA | 40% [d] | 62% | 50-150% |
| | 13C2-PFTeDA | 35% [d] | 60% | 50-150% |
| | 13C3-PFBS | 63% | 78% | 50-150% |
| | 13C3-PFHxS | 65% | 73% | 50-150% |
| | 13C8-PFOS | 61% | 75% | 50-150% |
| | 13C8-FOSA | 15% [d] | 47% [d] | 50-150% |
| | d3-MeFOSAA | 50% | 67% | 50-150% |
| | 13C2-4:2FTS | 57% | 70% | 50-150% |
| | 13C2-6:2FTS | 61% | 75% | 50-150% |
| | 13C2-8:2FTS | 46% [d] | 68% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-27A | | |
| **Lab Sample ID:** | FA77709-5 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 19.5 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5121.D | 1 | 08/21/20 20:06 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5072.D | 10 | 08/21/20 00:36 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.26 g | 1.0 ml |
| Run #2 | 2.26 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0098 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0313 | 0.0045 | 0.0023 | 0.00091 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0472 | 0.0045 | 0.0023 | 0.00091 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0198 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0141 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid [c] | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0143 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0134 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0882 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0079 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.330 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA [c] | 0.045 U [b] | 0.11 | 0.045 | 0.023 | mg/kg | |
| 2991-50-6 | EtFOSAA [c] | 0.045 U [b] | 0.11 | 0.045 | 0.023 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0023 U | 0.0045 | 0.0023 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0658 | 0.0045 | 0.0023 | 0.0011 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-27A | | |
| **Lab Sample ID:** | FA77709-5 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 19.5 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.023 U [b] | 0.045 | 0.023 | 0.011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 55% | 57% | 50-150% |
| | 13C5-PFPeA | 51% | 55% | 50-150% |
| | 13C5-PFHxA | 52% | 58% | 50-150% |
| | 13C4-PFHpA | 52% | 58% | 50-150% |
| | 13C8-PFOA | 53% | 61% | 50-150% |
| | 13C9-PFNA | 47% [d] | 59% | 50-150% |
| | 13C6-PFDA | 42% [d] | 57% | 50-150% |
| | 13C7-PFUnDA | 41% [d] | 52% | 50-150% |
| | 13C2-PFDoDA | 38% [d] | 49% [d] | 50-150% |
| | 13C2-PFTeDA | 25% [d] | 40% [d] | 50-150% |
| | 13C3-PFBS | 58% | 63% | 50-150% |
| | 13C3-PFHxS | 58% | 57% | 50-150% |
| | 13C8-PFOS | 54% | 59% | 50-150% |
| | 13C8-FOSA | 18% [d] | 42% [d] | 50-150% |
| | d3-MeFOSAA | 41% [d] | 48% [d] | 50-150% |
| | 13C2-4:2FTS | 53% | 55% | 50-150% |
| | 13C2-6:2FTS | 60% | 64% | 50-150% |
| | 13C2-8:2FTS | 49% [d] | 56% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | | |
|---|---|---|---|---|
| **Client Sample ID:** | T1-27B | | | |
| **Lab Sample ID:** | FA77709-6 | | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | | **Percent Solids:** | 18.9 |
| **Project:** | 1204074 | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5122.D | 1 | 08/21/20 20:21 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5073.D | 10 | 08/21/20 00:51 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.58 g | 1.0 ml |
| Run #2 | 2.58 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0021 U | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.0082 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.0082 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0021 U | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0021 U | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0056 | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0021 U | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0351 | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0021 U | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0021 U | 0.0041 | 0.0021 | 0.0010 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.041 U [b] | 0.10 | 0.041 | 0.021 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.041 U [b] | 0.10 | 0.041 | 0.021 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0030 | 0.0041 | 0.0021 | 0.0010 | mg/kg | J |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-27B | | |
| **Lab Sample ID:** | FA77709-6 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 18.9 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.021 U [b] | 0.041 | 0.021 | 0.010 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 54% | 63% | 50-150% |
| | 13C5-PFPeA | 43% [d] | 61% | 50-150% |
| | 13C5-PFHxA | 44% [d] | 63% | 50-150% |
| | 13C4-PFHpA | 46% [d] | 65% | 50-150% |
| | 13C8-PFOA | 48% [d] | 68% | 50-150% |
| | 13C9-PFNA | 44% [d] | 62% | 50-150% |
| | 13C6-PFDA | 35% [d] | 61% | 50-150% |
| | 13C7-PFUnDA | 38% [d] | 58% | 50-150% |
| | 13C2-PFDoDA | 29% [d] | 57% | 50-150% |
| | 13C2-PFTeDA | 43% [d] | 63% | 50-150% |
| | 13C3-PFBS | 50% | 67% | 50-150% |
| | 13C3-PFHxS | 55% | 65% | 50-150% |
| | 13C8-PFOS | 55% | 62% | 50-150% |
| | 13C8-FOSA | 14% [d] | 41% [d] | 50-150% |
| | d3-MeFOSAA | 46% [d] | 61% | 50-150% |
| | 13C2-4:2FTS | 46% [d] | 59% | 50-150% |
| | 13C2-6:2FTS | 54% | 66% | 50-150% |
| | 13C2-8:2FTS | 44% [d] | 62% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-39A | | |
| **Lab Sample ID:** | FA77709-7 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 23.1 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5123.D | 1 | 08/21/20 20:37 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5074.D | 10 | 08/21/20 01:07 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.28 g | 1.0 ml |
| Run #2 | 2.28 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0119 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0302 | 0.0038 | 0.0019 | 0.00076 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0671 | 0.0038 | 0.0019 | 0.00076 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0211 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0268 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0371 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0324 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.263 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0151 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.363 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0019 U | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0019 U | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.038 U [b] | 0.095 | 0.038 | 0.019 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.038 U [b] | 0.095 | 0.038 | 0.019 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0019 U | 0.0038 | 0.0019 | 0.00095 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.215 | 0.0038 | 0.0019 | 0.00095 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-39A | | |
| **Lab Sample ID:** | FA77709-7 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 23.1 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.019 U [b] | 0.038 | 0.019 | 0.0095 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 60% | 62% | 50-150% |
| | 13C5-PFPeA | 53% | 61% | 50-150% |
| | 13C5-PFHxA | 53% | 65% | 50-150% |
| | 13C4-PFHpA | 52% | 62% | 50-150% |
| | 13C8-PFOA | 54% | 67% | 50-150% |
| | 13C9-PFNA | 47% [d] | 63% | 50-150% |
| | 13C6-PFDA | 40% [d] | 62% | 50-150% |
| | 13C7-PFUnDA | 41% [d] | 55% | 50-150% |
| | 13C2-PFDoDA | 41% [d] | 57% | 50-150% |
| | 13C2-PFTeDA | 28% [d] | 47% [d] | 50-150% |
| | 13C3-PFBS | 60% | 65% | 50-150% |
| | 13C3-PFHxS | 60% | 67% | 50-150% |
| | 13C8-PFOS | 58% | 64% | 50-150% |
| | 13C8-FOSA | 12% [d] | 37% [d] | 50-150% |
| | d3-MeFOSAA | 43% [d] | 53% | 50-150% |
| | 13C2-4:2FTS | 55% | 59% | 50-150% |
| | 13C2-6:2FTS | 75% | 87% | 50-150% |
| | 13C2-8:2FTS | 49% [d] | 64% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-39B | | |
| **Lab Sample ID:** | FA77709-8 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 15.1 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5124.D | 1 | 08/21/20 20:52 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5075.D | 10 | 08/21/20 01:23 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.35 g | 1.0 ml |
| Run #2 | 2.35 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0197 | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0298 [b] | 0.056 | 0.028 | 0.011 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0427 [b] | 0.056 | 0.028 | 0.011 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0283 [b] | 0.056 | 0.028 | 0.014 | mg/kg | J |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0450 | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0068 | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0951 | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0028 U | 0.0056 | 0.0028 | 0.0014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.056 U [b] | 0.14 | 0.056 | 0.028 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.056 U [b] | 0.14 | 0.056 | 0.028 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0637 | 0.0056 | 0.0028 | 0.0014 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-39B | | |
| **Lab Sample ID:** | FA77709-8 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 15.1 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.028 U [b] | 0.056 | 0.028 | 0.014 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 52% | 57% | 50-150% |
| | 13C5-PFPeA | 39% [d] | 54% | 50-150% |
| | 13C5-PFHxA | 40% [d] | 55% | 50-150% |
| | 13C4-PFHpA | 41% [d] | 55% | 50-150% |
| | 13C8-PFOA | 45% [d] | 58% | 50-150% |
| | 13C9-PFNA | 43% [d] | 57% | 50-150% |
| | 13C6-PFDA | 36% [d] | 57% | 50-150% |
| | 13C7-PFUnDA | 37% [d] | 53% | 50-150% |
| | 13C2-PFDoDA | 34% [d] | 52% | 50-150% |
| | 13C2-PFTeDA | 30% [d] | 48% [d] | 50-150% |
| | 13C3-PFBS | 47% [d] | 59% | 50-150% |
| | 13C3-PFHxS | 51% | 60% | 50-150% |
| | 13C8-PFOS | 52% | 58% | 50-150% |
| | 13C8-FOSA | 15% [d] | 38% [d] | 50-150% |
| | d3-MeFOSAA | 45% [d] | 55% | 50-150% |
| | 13C2-4:2FTS | 43% [d] | 53% | 50-150% |
| | 13C2-6:2FTS | 54% | 61% | 50-150% |
| | 13C2-8:2FTS | 45% [d] | 56% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-XXX | | |
| **Lab Sample ID:** | FA77709-9 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.7 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5127.D | 1 | 08/21/20 21:39 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5078.D | 10 | 08/21/20 02:10 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.08 g | 1.0 ml |
| Run #2 | 2.08 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0076 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0239 | 0.0044 | 0.0022 | 0.00089 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0345 | 0.0044 | 0.0022 | 0.00089 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0136 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0086 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0023 | 0.0044 | 0.0022 | 0.0011 | mg/kg | J |
| 335-76-2 | Perfluorodecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0103 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0092 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0552 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0047 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.242 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.044 U [b] | 0.11 | 0.044 | 0.022 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.044 U [b] | 0.11 | 0.044 | 0.022 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0375 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-XXX | | |
| **Lab Sample ID:** | FA77709-9 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 21.7 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 59% | 58% | 50-150% |
| | 13C5-PFPeA | 56% | 57% | 50-150% |
| | 13C5-PFHxA | 57% | 58% | 50-150% |
| | 13C4-PFHpA | 55% | 59% | 50-150% |
| | 13C8-PFOA | 57% | 62% | 50-150% |
| | 13C9-PFNA | 50% | 60% | 50-150% |
| | 13C6-PFDA | 47% [c] | 60% | 50-150% |
| | 13C7-PFUnDA | 43% [c] | 56% | 50-150% |
| | 13C2-PFDoDA | 45% [c] | 54% | 50-150% |
| | 13C2-PFTeDA | 39% [c] | 55% | 50-150% |
| | 13C3-PFBS | 63% | 63% | 50-150% |
| | 13C3-PFHxS | 60% | 64% | 50-150% |
| | 13C8-PFOS | 57% | 59% | 50-150% |
| | 13C8-FOSA | 26% [c] | 54% | 50-150% |
| | d3-MeFOSAA | 48% [c] | 55% | 50-150% |
| | 13C2-4:2FTS | 56% | 55% | 50-150% |
| | 13C2-6:2FTS | 60% | 63% | 50-150% |
| | 13C2-8:2FTS | 53% | 58% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.



U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-XXXX | | |
| **Lab Sample ID:** | FA77709-10 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 19.3 |
| **Project:** | 1204074 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5128.D | 1 | 08/21/20 21:55 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 2Q52984.D | 10 | 08/24/20 05:01 | NAF | 08/19/20 11:00 | OP81627 | S2Q787 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.44 g | 1.0 ml |
| Run #2 | 2.44 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0138 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0380 | 0.0042 | 0.0021 | 0.00085 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0744 | 0.0042 | 0.0021 | 0.00085 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0249 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0333 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0361 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0341 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.289 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0298 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 1.06 [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0039 | 0.0042 | 0.0021 | 0.0011 | mg/kg | J |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.021 U [b] | 0.042 | 0.021 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.042 U [b] | 0.11 | 0.042 | 0.021 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.042 U [b] | 0.11 | 0.042 | 0.021 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0021 U | 0.0042 | 0.0021 | 0.0011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.248 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |

U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T1-XXXX | | |
| **Lab Sample ID:** | FA77709-10 | **Date Sampled:** | 08/10/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/12/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 19.3 |
| **Project:** | 1204074 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0089 | 0.0042 | 0.0021 | 0.0011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 65% | 74% | 50-150% |
| | 13C5-PFPeA | 61% | 68% | 50-150% |
| | 13C5-PFHxA | 60% | 65% | 50-150% |
| | 13C4-PFHpA | 58% | 61% | 50-150% |
| | 13C8-PFOA | 58% | 63% | 50-150% |
| | 13C9-PFNA | 47% d | 58% | 50-150% |
| | 13C6-PFDA | 41% d | 50% | 50-150% |
| | 13C7-PFUnDA | 42% d | 59% | 50-150% |
| | 13C2-PFDoDA | 40% d | 53% | 50-150% |
| | 13C2-PFTeDA | 29% d | 35% d | 50-150% |
| | 13C3-PFBS | 69% | 70% | 50-150% |
| | 13C3-PFHxS | 66% | 70% | 50-150% |
| | 13C8-PFOS | 58% | 54% | 50-150% |
| | 13C8-FOSA | 17% d | 35% d | 50-150% |
| | d3-MeFOSAA | 48% d | 58% | 50-150% |
| | 13C2-4:2FTS | 62% | 62% | 50-150% |
| | 13C2-6:2FTS | 81% | 88% | 50-150% |
| | 13C2-8:2FTS | 54% | 50% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Section 5



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA77709

**SGS North America Inc.**
**CHAIN OF CUSTODY RECORD**

Locations Nationwide
Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana
www.us.sgs.com

CLIENT: SGS North America Inc. - Alaska Division
CONTACT: Julie Shumway PHONE NO: (907) 562-2343
PROJECT NAME: 1204074 PWSID#: NPDL#:
REPORTS TO: Julie Shumway E-MAIL: Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com
INVOICE TO: SGS - Alaska QUOTE #: P.O. #: 1204074

SGS Reference: SGS ORLANDO FL
Page 1 of 1
Additional Comments: All soils report out in dry weight unless

Preservative Used: NONE
TYPE C = COMP G = GRAB MI = Multi Incremental Soils

INITIAL ASSESSMENT AG
LABEL VERIFICATION MK

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HHMM | MATRIX/ MATRIX CODE | # CONTAINERS | TYPE | EPA 537 PFAS | | | | | MS | MSD | SGS lab # | Location ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | T1-07A | 08/10/2020 | 11:35:00 | SO | 1 | | X | | | | | | | 1204074001 | |
| 2 | T1-07B | 08/10/2020 | 12:00:00 | SO | 1 | | X | | | | | | | 1204074002 | |
| 3 | T1-23A | 08/10/2020 | 10:40:00 | SO | 1 | | X | | | | | | | 1204074003 | |
| 4 | T1-23B | 08/10/2020 | 11:00:00 | SO | 1 | | X | | | | | | | 1204074004 | |
| 5 | T1-27A | 08/10/2020 | 09:15:00 | SO | 1 | | X | | | | | | | 1204074005 | |
| 6 | T1-27B | 08/10/2020 | 10:00:00 | SO | 1 | | X | | | | | | | 1204074006 | |
| 7 | T1-39A | 08/10/2020 | 13:35:00 | SO | 1 | | X | | | | | | | 1204074007 | |
| 8 | T1-39B | 08/10/2020 | 13:50:00 | SO | 1 | | X | | | | | | | 1204074008 | |
| 9 | T1-XXX | 08/10/2020 | 09:20:00 | Solid | 1 | | X | | | | | | | 1204074009 | |
| 10 | T1-XXXX | 08/10/2020 | 13:45:00 | Solid | 1 | | X | | | | | | | 1204074010 | |

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) J Shumway | 8/11/20 | 0959 | Fedex |
| (2) Fedex | 8/12/20 | 945 | [illegible signature] |
| (3) | | | |
| (4) | | | Received For Laboratory By: |

DOD Project? NO
Report to DL (J Flags)? NO
If J- Report as DL/LOD/LOQ.
Data Deliverable Requirements: QC2
Cooler ID:
Requested Turnaround Time and-or Special Instructions:
Temp Blank °C: 1.4
or Ambient [ ]
Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411



FA77709: Chain of Custody
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# SGS Sample Receipt Summary

**Job Number:** FA77709 **Client:** SGS NORTH AMERICA, INC. - ALASKA DI **Project:** 1204074

**Date / Time Received:** 8/12/2020 9:45:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 148348008273

**Therm ID:** **Therm CF:** **# of Coolers:** N/A

**Cooler Temps (Raw Measured) °C:**

**Cooler Temps (Corrected) °C:**

| Cooler Information | Y | N |
|---|---|---|
| 1. Custody Seals Present | ☑ | ☐ |
| 2. Custody Seals Intact | ☑ | ☐ |
| 3. Temp criteria achieved | ☐ | ☐ |
| 4. Cooler temp verification | N/A | |
| 5. Cooler media | N/A | |

| Trip Blank Information | Y | N | N/A |
|---|---|---|---|
| 1. Trip Blank present / cooler | ☐ | ☐ | ☑ |
| 2. Trip Blank listed on COC | ☐ | ☐ | ☑ |

| | W | S | N/A |
|---|---|---|---|
| 3. Type Of TB Received | ☐ | ☐ | ☑ |

| Sample Information | Y | N | N/A |
|---|---|---|---|
| 1. Sample labels present on bottles | ☑ | ☐ | |
| 2. Samples preserved properly | ☑ | ☐ | |
| 3. Sufficient volume/containers recvd for analysis: | ☑ | ☐ | |
| 4. Condition of sample | Intact | | |
| 5. Sample recvd within HT | ☑ | ☐ | |
| 6. Dates/Times/IDs on COC match Sample Label | ☑ | ☐ | |
| 7. VOCs have headspace | ☐ | ☐ | ☑ |
| 8. Bottles received for unspecified tests | ☐ | ☑ | |
| 9. Compositing instructions clear | ☐ | ☐ | ☑ |
| 10. Voa Soil Kits/Jars received past 48hrs? | ☐ | ☐ | ☑ |
| 11. % Solids Jar received? | ☐ | ☐ | ☑ |
| 12. Residual Chlorine Present? | ☐ | ☐ | ☑ |

**Misc. Information**

Number of Encores: 25-Gram ______ 5-Gram ______ Number of 5035 Field Kits: ______ Number of Lab Filtered Metals: ______

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) ______ ______

Residual Chlorine Test Strip Lot #: ______

Comments

SM001
Rev. Date 05/24/17

Technician: BRYANG Date: 8/12/2020 9:45:00 AM Reviewer: ______ Date: ______



FA77709: Chain of Custody
Page 2 of 2

# QC Evaluation: DOD QSM5.x Limits

**Job Number:** FA77709
**Account:** SGS North America, Inc
**Project:** 1204074
**Collected:** 08/10/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81627 | EPA 537M QSM5.3 B-15 | | | | | | |
| OP81627-BS | 375-22-4 | Perfluorobutanoic acid | BSP | REC | 93 | % | 71-135 |
| OP81627-BS | 2706-90-3 | Perfluoropentanoic acid | BSP | REC | 86 | % | 69-132 |
| OP81627-BS | 307-24-4 | Perfluorohexanoic acid | BSP | REC | 87 | % | 70-132 |
| OP81627-BS | 375-85-9 | Perfluoroheptanoic acid | BSP | REC | 89 | % | 71-131 |
| OP81627-BS | 335-67-1 | Perfluorooctanoic acid | BSP | REC | 93 | % | 69-133 |
| OP81627-BS | 375-95-1 | Perfluorononanoic acid | BSP | REC | 87 | % | 72-129 |
| OP81627-BS | 335-76-2 | Perfluorodecanoic acid | BSP | REC | 88 | % | 69-133 |
| OP81627-BS | 2058-94-8 | Perfluoroundecanoic acid | BSP | REC | 88 | % | 64-136 |
| OP81627-BS | 307-55-1 | Perfluorododecanoic acid | BSP | REC | 88 | % | 69-135 |
| OP81627-BS | 72629-94-8 | Perfluorotridecanoic acid | BSP | REC | 88 | % | 66-139 |
| OP81627-BS | 376-06-7 | Perfluorotetradecanoic acid | BSP | REC | 85 | % | 69-133 |
| OP81627-BS | 375-73-5 | Perfluorobutanesulfonic acid | BSP | REC | 91 | % | 72-128 |
| OP81627-BS | 2706-91-4 | Perfluoropentanesulfonic acid | BSP | REC | 81 | % | 73-123 |
| OP81627-BS | 355-46-4 | Perfluorohexanesulfonic acid | BSP | REC | 85 | % | 67-130 |
| OP81627-BS | 375-92-8 | Perfluoroheptanesulfonic acid | BSP | REC | 93 | % | 70-132 |
| OP81627-BS | 1763-23-1 | Perfluorooctanesulfonic acid | BSP | REC | 85 | % | 67-136 |
| OP81627-BS | 68259-12-1 | Perfluorononanesulfonic acid | BSP | REC | 87 | % | 69-125 |
| OP81627-BS | 335-77-3 | Perfluorodecanesulfonic acid | BSP | REC | 87 | % | 59-134 |
| OP81627-BS | 754-91-6 | PFOSA | BSP | REC | 86 | % | 67-137 |
| OP81627-BS | 2355-31-9 | MeFOSAA | BSP | REC | 94 | % | 63-144 |
| OP81627-BS | 2991-50-6 | EtFOSAA | BSP | REC | 86 | % | 61-139 |
| OP81627-BS | 757124-72-4 | 4:2 Fluorotelomer sulfonate | BSP | REC | 95 | % | 62-145 |
| OP81627-BS | 27619-97-2 | 6:2 Fluorotelomer sulfonate | BSP | REC | 96 | % | 64-140 |
| OP81627-BS | 39108-34-4 | 8:2 Fluorotelomer sulfonate | BSP | REC | 97 | % | 65-137 |
| OP81627-MS* | 375-22-4 | Perfluorobutanoic acid | MS | REC | 100 | % | 71-135 |
| OP81627-MS* | 2706-90-3 | Perfluoropentanoic acid | MS | REC | 94 | % | 69-132 |
| OP81627-MS* | 307-24-4 | Perfluorohexanoic acid | MS | REC | 92 | % | 70-132 |
| OP81627-MS* | 375-85-9 | Perfluoroheptanoic acid | MS | REC | 98 | % | 71-131 |
| OP81627-MS* | 335-67-1 | Perfluorooctanoic acid | MS | REC | 103 | % | 69-133 |
| OP81627-MS* | 375-95-1 | Perfluorononanoic acid | MS | REC | 91 | % | 72-129 |
| OP81627-MS* | 335-76-2 | Perfluorodecanoic acid | MS | REC | 91 | % | 69-133 |
| OP81627-MS* | 2058-94-8 | Perfluoroundecanoic acid | MS | REC | 94 | % | 64-136 |
| OP81627-MS* | 307-55-1 | Perfluorododecanoic acid | MS | REC | 96 | % | 69-135 |
| OP81627-MS* | 72629-94-8 | Perfluorotridecanoic acid | MS | REC | 86 | % | 66-139 |
| OP81627-MS* | 376-06-7 | Perfluorotetradecanoic acid | MS | REC | 92 | % | 69-133 |
| OP81627-MS* | 375-73-5 | Perfluorobutanesulfonic acid | MS | REC | 100 | % | 72-128 |
| OP81627-MS* | 2706-91-4 | Perfluoropentanesulfonic acid | MS | REC | 87 | % | 73-123 |
| OP81627-MS* | 355-46-4 | Perfluorohexanesulfonic acid | MS | REC | 98 | % | 67-130 |
| OP81627-MS* | 375-92-8 | Perfluoroheptanesulfonic acid | MS | REC | 107 | % | 70-132 |
| OP81627-MS* | 1763-23-1 | Perfluorooctanesulfonic acid | MS | REC | 62 [a] | % | 67-136 |
| OP81627-MS* | 68259-12-1 | Perfluorononanesulfonic acid | MS | REC | 77 | % | 69-125 |
| OP81627-MS* | 335-77-3 | Perfluorodecanesulfonic acid | MS | REC | 119 | % | 59-134 |

* Sample used for QC is not from job FA77709

# QC Evaluation: DOD QSM5.x Limits

**Job Number:** FA77709
**Account:** SGS North America, Inc
**Project:** 1204074
**Collected:** 08/10/20

| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81627-MS* | 754-91-6 | PFOSA | MS | REC | 96 | % | 67-137 |
| OP81627-MS* | 2355-31-9 | MeFOSAA | MS | REC | 98 | % | 63-144 |
| OP81627-MS* | 2991-50-6 | EtFOSAA | MS | REC | 97 | % | 61-139 |
| OP81627-MS* | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MS | REC | 103 | % | 62-145 |
| OP81627-MS* | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MS | REC | 105 | % | 64-140 |
| OP81627-MS* | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MS | REC | 100 | % | 65-137 |
| OP81627-MSD* | 375-22-4 | Perfluorobutanoic acid | MSD | REC | 99 | % | 71-135 |
| OP81627-MSD* | 375-22-4 | Perfluorobutanoic acid | MSD | RPD | 5 | % | 30 |
| OP81627-MSD* | 2706-90-3 | Perfluoropentanoic acid | MSD | REC | 93 | % | 69-132 |
| OP81627-MSD* | 2706-90-3 | Perfluoropentanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 307-24-4 | Perfluorohexanoic acid | MSD | REC | 91 | % | 70-132 |
| OP81627-MSD* | 307-24-4 | Perfluorohexanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 375-85-9 | Perfluoroheptanoic acid | MSD | REC | 96 | % | 71-131 |
| OP81627-MSD* | 375-85-9 | Perfluoroheptanoic acid | MSD | RPD | 5 | % | 30 |
| OP81627-MSD* | 335-67-1 | Perfluorooctanoic acid | MSD | REC | 103 | % | 69-133 |
| OP81627-MSD* | 335-67-1 | Perfluorooctanoic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD* | 375-95-1 | Perfluorononanoic acid | MSD | REC | 91 | % | 72-129 |
| OP81627-MSD* | 375-95-1 | Perfluorononanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 335-76-2 | Perfluorodecanoic acid | MSD | REC | 88 | % | 69-133 |
| OP81627-MSD* | 335-76-2 | Perfluorodecanoic acid | MSD | RPD | 8 | % | 30 |
| OP81627-MSD* | 2058-94-8 | Perfluoroundecanoic acid | MSD | REC | 93 | % | 64-136 |
| OP81627-MSD* | 2058-94-8 | Perfluoroundecanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 307-55-1 | Perfluorododecanoic acid | MSD | REC | 95 | % | 69-135 |
| OP81627-MSD* | 307-55-1 | Perfluorododecanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 72629-94-8 | Perfluorotridecanoic acid | MSD | REC | 92 | % | 66-139 |
| OP81627-MSD* | 72629-94-8 | Perfluorotridecanoic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD* | 376-06-7 | Perfluorotetradecanoic acid | MSD | REC | 92 | % | 69-133 |
| OP81627-MSD* | 376-06-7 | Perfluorotetradecanoic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD* | 375-73-5 | Perfluorobutanesulfonic acid | MSD | REC | 100 | % | 72-128 |
| OP81627-MSD* | 375-73-5 | Perfluorobutanesulfonic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | REC | 86 | % | 73-123 |
| OP81627-MSD* | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | RPD | 5 | % | 30 |
| OP81627-MSD* | 355-46-4 | Perfluorohexanesulfonic acid | MSD | REC | 103 | % | 67-130 |
| OP81627-MSD* | 355-46-4 | Perfluorohexanesulfonic acid | MSD | RPD | 2 | % | 30 |
| OP81627-MSD* | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | REC | 107 | % | 70-132 |
| OP81627-MSD* | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD* | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | REC | 139 [a] | % | 67-136 |
| OP81627-MSD* | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | RPD | 23 | % | 30 |
| OP81627-MSD* | 68259-12-1 | Perfluorononanesulfonic acid | MSD | REC | 72 | % | 69-125 |
| OP81627-MSD* | 68259-12-1 | Perfluorononanesulfonic acid | MSD | RPD | 9 | % | 30 |
| OP81627-MSD* | 335-77-3 | Perfluorodecanesulfonic acid | MSD | REC | 120 | % | 59-134 |
| OP81627-MSD* | 335-77-3 | Perfluorodecanesulfonic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD* | 754-91-6 | PFOSA | MSD | REC | 91 | % | 67-137 |
| OP81627-MSD* | 754-91-6 | PFOSA | MSD | RPD | 9 | % | 30 |
| OP81627-MSD* | 2355-31-9 | MeFOSAA | MSD | REC | 100 | % | 63-144 |

* Sample used for QC is not from job FA77709

# QC Evaluation: DOD QSM5.x Limits



**Job Number:** FA77709
**Account:** SGS North America, Inc
**Project:** 1204074
**Collected:** 08/10/20

| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81627-MSD* | 2355-31-9 | MeFOSAA | MSD | RPD | 1 | % | 30 |
| OP81627-MSD* | 2991-50-6 | EtFOSAA | MSD | REC | 96 | % | 61-139 |
| OP81627-MSD* | 2991-50-6 | EtFOSAA | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | REC | 102 | % | 62-145 |
| OP81627-MSD* | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | RPD | 4 | % | 30 |
| OP81627-MSD* | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | REC | 102 | % | 64-140 |
| OP81627-MSD* | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | RPD | 6 | % | 30 |
| OP81627-MSD* | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | REC | 101 | % | 65-137 |
| OP81627-MSD* | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | RPD | 3 | % | 30 |

(a) Outside control limits due to high level in sample relative to spike amount.



* Sample used for QC is not from job FA77709

# MS Semi-volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Instrument Blank



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q70-IBLK | 4Q5022.D | 1 | 08/20/20 | NAF | n/a | n/a | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 104% | 50-150% |
| | 13C5-PFPeA | 104% | 50-150% |
| | 13C5-PFHxA | 105% | 50-150% |
| | 13C4-PFHpA | 105% | 50-150% |
| | 13C8-PFOA | 109% | 50-150% |
| | 13C9-PFNA | 107% | 50-150% |
| | 13C6-PFDA | 108% | 50-150% |
| | 13C7-PFUnDA | 106% | 50-150% |
| | 13C2-PFDoDA | 106% | 50-150% |
| | 13C2-PFTeDA | 106% | 50-150% |
| | 13C3-PFBS | 107% | 50-150% |
| | 13C3-PFHxS | 103% | 50-150% |
| | 13C8-PFOS | 103% | 50-150% |
| | 13C8-FOSA | 113% | 50-150% |
| | d3-MeFOSAA | 105% | 50-150% |

# Instrument Blank



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q70-IBLK | 4Q5022.D | 1 | 08/20/20 | NAF | n/a | n/a | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-4:2FTS | 94% | 50-150% |
| | 13C2-6:2FTS | 98% | 50-150% |
| | 13C2-8:2FTS | 95% | 50-150% |

# Instrument Blank



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q71-IBLK | 4Q5092.D | 1 | 08/21/20 | NG | n/a | n/a | S4Q71 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 99% | 50-150% |
| | 13C5-PFPeA | 100% | 50-150% |
| | 13C5-PFHxA | 102% | 50-150% |
| | 13C4-PFHpA | 102% | 50-150% |
| | 13C8-PFOA | 107% | 50-150% |
| | 13C9-PFNA | 104% | 50-150% |
| | 13C6-PFDA | 108% | 50-150% |
| | 13C7-PFUnDA | 106% | 50-150% |
| | 13C2-PFDoDA | 107% | 50-150% |
| | 13C2-PFTeDA | 108% | 50-150% |
| | 13C3-PFBS | 105% | 50-150% |
| | 13C3-PFHxS | 103% | 50-150% |

# Instrument Blank



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q71-IBLK | 4Q5092.D | 1 | 08/21/20 | NG | n/a | n/a | S4Q71 |




**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C8-PFOS | 103% | 50-150% |
| | 13C8-FOSA | 107% | 50-150% |
| | d3-MeFOSAA | 108% | 50-150% |
| | 13C2-4:2FTS | 92% | 50-150% |
| | 13C2-6:2FTS | 96% | 50-150% |
| | 13C2-8:2FTS | 95% | 50-150% |

# Instrument Blank



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S2Q787-IBLK | 2Q52901.D | 1 | 08/23/20 | NAF | n/a | n/a | S2Q787 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-10

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 99% | 50-150% |
| | 13C5-PFPeA | 88% | 50-150% |
| | 13C5-PFHxA | 89% | 50-150% |
| | 13C4-PFHpA | 91% | 50-150% |
| | 13C8-PFOA | 90% | 50-150% |
| | 13C9-PFNA | 89% | 50-150% |
| | 13C6-PFDA | 92% | 50-150% |
| | 13C7-PFUnDA | 93% | 50-150% |
| | 13C2-PFDoDA | 91% | 50-150% |
| | 13C2-PFTeDA | 83% | 50-150% |
| | 13C3-PFBS | 93% | 50-150% |
| | 13C3-PFHxS | 95% | 50-150% |
| | 13C8-PFOS | 94% | 50-150% |
| | 13C8-FOSA | 96% | 50-150% |
| | d3-MeFOSAA | 88% | 50-150% |
| | 13C2-4:2FTS | 85% | 50-150% |
| | 13C2-6:2FTS | 87% | 50-150% |
| | 13C2-8:2FTS | 85% | 50-150% |

# Method Blank Summary



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MB | 4Q5067.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 0.38 | 1.0 | 0.25 | ug/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 85% | 50-150% |
| | 13C5-PFPeA | 90% | 50-150% |
| | 13C5-PFHxA | 93% | 50-150% |
| | 13C4-PFHpA | 93% | 50-150% |
| | 13C8-PFOA | 100% | 50-150% |
| | 13C9-PFNA | 96% | 50-150% |
| | 13C6-PFDA | 97% | 50-150% |
| | 13C7-PFUnDA | 93% | 50-150% |

# Method Blank Summary



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MB | 4Q5067.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 93% | 50-150% |
| | 13C2-PFTeDA | 89% | 50-150% |
| | 13C3-PFBS | 97% | 50-150% |
| | 13C3-PFHxS | 97% | 50-150% |
| | 13C8-PFOS | 94% | 50-150% |
| | 13C8-FOSA | 93% | 50-150% |
| | d3-MeFOSAA | 98% | 50-150% |
| | 13C2-4:2FTS | 86% | 50-150% |
| | 13C2-6:2FTS | 91% | 50-150% |
| | 13C2-8:2FTS | 87% | 50-150% |

# Blank Spike Summary

**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-BS | 4Q5066.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 10 | 9.3 | 93 | 71-135 |
| 2706-90-3 | Perfluoropentanoic acid | 10 | 8.6 | 86 | 69-132 |
| 307-24-4 | Perfluorohexanoic acid | 10 | 8.7 | 87 | 70-132 |
| 375-85-9 | Perfluoroheptanoic acid | 10 | 8.9 | 89 | 71-131 |
| 335-67-1 | Perfluorooctanoic acid | 10 | 9.3 | 93 | 69-133 |
| 375-95-1 | Perfluorononanoic acid | 10 | 8.7 | 87 | 72-129 |
| 335-76-2 | Perfluorodecanoic acid | 10 | 8.8 | 88 | 69-133 |
| 2058-94-8 | Perfluoroundecanoic acid | 10 | 8.8 | 88 | 64-136 |
| 307-55-1 | Perfluorododecanoic acid | 10 | 8.8 | 88 | 69-135 |
| 72629-94-8 | Perfluorotridecanoic acid | 10 | 8.8 | 88 | 66-139 |
| 376-06-7 | Perfluorotetradecanoic acid | 10 | 8.5 | 85 | 69-133 |
| 375-73-5 | Perfluorobutanesulfonic acid | 10 | 9.1 | 91 | 72-128 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 10 | 8.1 | 81 | 73-123 |
| 355-46-4 | Perfluorohexanesulfonic acid | 10 | 8.5 | 85 | 67-130 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 10 | 9.3 | 93 | 70-132 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 10 | 8.5 | 85 | 67-136 |
| 68259-12-1 | Perfluorononanesulfonic acid | 10 | 8.7 | 87 | 69-125 |
| 335-77-3 | Perfluorodecanesulfonic acid | 10 | 8.7 | 87 | 59-134 |
| 754-91-6 | PFOSA | 10 | 8.6 | 86 | 67-137 |
| 2355-31-9 | MeFOSAA | 10 | 9.4 | 94 | 63-144 |
| 2991-50-6 | EtFOSAA | 10 | 8.6 | 86 | 61-139 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 10 | 9.5 | 95 | 62-145 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 10 | 9.6 | 96 | 64-140 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 10 | 9.7 | 97 | 65-137 |

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C4-PFBA | 90% | 50-150% |
| | 13C5-PFPeA | 95% | 50-150% |
| | 13C5-PFHxA | 98% | 50-150% |
| | 13C4-PFHpA | 97% | 50-150% |
| | 13C8-PFOA | 103% | 50-150% |
| | 13C9-PFNA | 99% | 50-150% |
| | 13C6-PFDA | 101% | 50-150% |
| | 13C7-PFUnDA | 97% | 50-150% |

* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-BS | 4Q5066.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 96% | 50-150% |
| | 13C2-PFTeDA | 95% | 50-150% |
| | 13C3-PFBS | 97% | 50-150% |
| | 13C3-PFHxS | 102% | 50-150% |
| | 13C8-PFOS | 100% | 50-150% |
| | 13C8-FOSA | 94% | 50-150% |
| | d3-MeFOSAA | 103% | 50-150% |
| | 13C2-4:2FTS | 95% | 50-150% |
| | 13C2-6:2FTS | 99% | 50-150% |
| | 13C2-8:2FTS | 96% | 50-150% |



* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MS | 4Q5133.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| OP81627-MSD | 4Q5134.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 | 4Q5132.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 [a] | 4Q5083.D | 10 | 08/21/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | Compound | FA77769-4 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | Spike ug/kg | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 3.5 U | | 36.1 | 36.0 | 100 | 34.9 | 34.4 | 99 | 5 | 71-135/30 |
| 2706-90-3 | Perfluoropentanoic acid | 1.4 | J | 36.1 | 35.3 | 94 | 34.9 | 33.8 | 93 | 4 | 69-132/30 |
| 307-24-4 | Perfluorohexanoic acid | 2.2 | J | 36.1 | 35.5 | 92 | 34.9 | 34.0 | 91 | 4 | 70-132/30 |
| 375-85-9 | Perfluoroheptanoic acid | 1.5 | J | 36.1 | 36.7 | 98 | 34.9 | 34.8 | 96 | 5 | 71-131/30 |
| 335-67-1 | Perfluorooctanoic acid | 1.7 | J | 36.1 | 38.9 | 103 | 34.9 | 37.7 | 103 | 3 | 69-133/30 |
| 375-95-1 | Perfluorononanoic acid | 1.2 | J | 36.1 | 34.2 | 91 | 34.9 | 33.0 | 91 | 4 | 72-129/30 |
| 335-76-2 | Perfluorodecanoic acid | 35 U [b] | | 36.1 | 33.0 | 91 | 34.9 | 30.6 | 88 | 8 | 69-133/30 |
| 2058-94-8 | Perfluoroundecanoic acid | 35 U [b] | | 36.1 | 34.0 | 94 | 34.9 | 32.6 | 93 | 4 | 64-136/30 |
| 307-55-1 | Perfluorododecanoic acid | 35 U [b] | | 36.1 | 34.5 | 96 | 34.9 | 33.0 | 95 | 4 | 69-135/30 |
| 72629-94-8 | Perfluorotridecanoic acid | 35 U [b] | | 36.1 | 31.1 | 86 | 34.9 | 32.2 | 92 | 3 | 66-139/30 |
| 376-06-7 | Perfluorotetradecanoic acid | 35 U [b] | | 36.1 | 33.1 | 92 | 34.9 | 32.1 | 92 | 3 | 69-133/30 |
| 375-73-5 | Perfluorobutanesulfonic acid | 3.5 U | | 36.1 | 36.1 | 100 | 34.9 | 34.7 | 100 | 4 | 72-128/30 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 3.5 U | | 36.1 | 31.3 | 87 | 34.9 | 29.9 | 86 | 5 | 73-123/30 |
| 355-46-4 | Perfluorohexanesulfonic acid | 6.9 | | 36.1 | 42.2 | 98 | 34.9 | 42.9 | 103 | 2 | 67-130/30 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 3.5 U | | 36.1 | 38.5 | 107 | 34.9 | 37.4 | 107 | 3 | 70-132/30 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 77.7 | | 36.1 | 100 | 62* [c] | 34.9 | 126 | 139* [c] | 23 | 67-136/30 |
| 68259-12-1 | Perfluorononanesulfonic acid | 3.5 U | | 36.1 | 27.7 | 77 | 34.9 | 25.2 | 72 | 9 | 69-125/30 |
| 335-77-3 | Perfluorodecanesulfonic acid | 3.5 U | | 36.1 | 43.1 | 119 | 34.9 | 41.7 | 120 | 3 | 59-134/30 |
| 754-91-6 | PFOSA | 35 U [b] | | 36.1 | 34.7 | 96 | 34.9 | 31.6 | 91 | 9 | 67-137/30 |
| 2355-31-9 | MeFOSAA | 87 U [b] | | 36.1 | 35.2 | 98 | 34.9 | 34.8 | 100 | 1 | 63-144/30 |
| 2991-50-6 | EtFOSAA | 87 U [b] | | 36.1 | 34.9 | 97 | 34.9 | 33.6 | 96 | 4 | 61-139/30 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 3.5 U | | 36.1 | 37.1 | 103 | 34.9 | 35.5 | 102 | 4 | 62-145/30 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 3.5 U | | 36.1 | 37.7 | 105 | 34.9 | 35.4 | 102 | 6 | 64-140/30 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 35 U [b] | | 36.1 | 36.2 | 100 | 34.9 | 35.1 | 101 | 3 | 65-137/30 |

| CAS No. | ID Standard Recoveries | MS | MSD | FA77769-4 | FA77769-4 | Limits |
|---|---|---|---|---|---|---|
| | 13C4-PFBA | 65% | 67% | 61% | 61% | 50-150% |
| | 13C5-PFPeA | 50% | 52% | 50% | 59% | 50-150% |
| | 13C5-PFHxA | 51% | 53% | 51% | 62% | 50-150% |
| | 13C4-PFHpA | 52% | 53% | 51% | 62% | 50-150% |
| | 13C8-PFOA | 55% | 56% | 55% | 65% | 50-150% |
| | 13C9-PFNA | 53% | 53% | 51% | 62% | 50-150% |
| | 13C6-PFDA | 47%* [d] | 45%* [d] | 41%* [d] | 62% | 50-150% |
| | 13C7-PFUnDA | 49%* [d] | 46%* [d] | 44%* [d] | 55% | 50-150% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** FA77709
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204074

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MS | 4Q5133.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| OP81627-MSD | 4Q5134.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 | 4Q5132.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 [a] | 4Q5083.D | 10 | 08/21/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77709-1, FA77709-2, FA77709-3, FA77709-4, FA77709-5, FA77709-6, FA77709-7, FA77709-8, FA77709-9, FA77709-10

| CAS No. | ID Standard Recoveries | MS | MSD | FA77769-4 | FA77769-4 | Limits |
|---|---|---|---|---|---|---|
| | 13C2-PFDoDA | 44%* [d] | 40%* [d] | 34%* [d] | 52% | 50-150% |
| | 13C2-PFTeDA | 40%* [d] | 32%* [d] | 25%* [d] | 50% | 50-150% |
| | 13C3-PFBS | 56% | 58% | 56% | 63% | 50-150% |
| | 13C3-PFHxS | 62% | 62% | 59% | 67% | 50-150% |
| | 13C8-PFOS | 63% | 65% | 61% | 61% | 50-150% |
| | 13C8-FOSA | 17%* [d] | 19%* [d] | 15%* [d] | 44%* [d] | 50-150% |
| | d3-MeFOSAA | 41%* [d] | 41%* [d] | 38%* [d] | 53% | 50-150% |
| | 13C2-4:2FTS | 56% | 58% | 53% | 59% | 50-150% |
| | 13C2-6:2FTS | 62% | 63% | 57% | 62% | 50-150% |
| | 13C2-8:2FTS | 47%* [d] | 45%* [d] | 40%* [d] | 58% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run #2.
(c) Outside control limits due to high level in sample relative to spike amount.
(d) Outside control limits due to matrix interference.



* = Outside of Control Limits.

## Laboratory Report of Analysis

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501

Report Number: **1204107**

Client Project: **20-2176 CRW Postmark Bog V2**

Dear Kyle Wiseman,

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 ten 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 Chuck 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.

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

## Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1204107**
Project Name/Site: **20-2176 CRW Postmark Bog V2**
Project Contact: **Kyle Wiseman**

Refer to sample receipt form for information on sample condition.

**T2-01A (1204107001) PS**

EPA 537 PFAS 24 were analyzed by SGS of Orlando, FL.
AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC ciriteria. The analyte associated with this surrogate was not detected above the LOQ in this sample.

**LCS for HBN 1810653 [XXX/43711 (1576258) LCS**

AK102/103 - Surrogate recovery in the LCS for 5a androstane does not meet QC criteria; however, the surrogate recoveries in the samples are within criteria.



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



SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
**t** 907.562.2343 **f** 907.561.5301 www.us.sgs.com
Member of SGS Group

# Report of Manual Integrations

| Laboratory ID | Client Sample ID | Analytical Batch | Analyte | Reason |
|---|---|---|---|---|
| **SW8021B** | | | | |
| 1576032 | LABREFQC | VFC15295 | P & M -Xylene | SP |



Manual Integration Reason Code Descriptions

| Code | Description |
|---|---|
| O | Original Chromatogram |
| M | Modified Chromatogram |
| SS | Skimmed surrogate |
| BLG | Closed baseline gap |
| RP | Reassign peak name |
| PIR | Pattern integration required |
| IT | Included tail |
| SP | Split peak |
| RSP | Removed split peak |
| FPS | Forced peak start/stop |
| BLC | Baseline correction |
| PNF | Peak not found by software |

All DRO/RRO analysis are integrated per SOP.



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## Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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/CVA/CVB | Continuing Calibration Verification |
| CCCV/CVC/CVCA/CVCB | Closing Continuing Calibration Verification |
| CL | Control Limit |
| DF | Analytical Dilution Factor |
| DL | Detection Limit (i.e., maximum method detection limit) |
| E | The analyte result is above the calibrated range. |
| GT | Greater Than |
| IB | Instrument Blank |
| ICV | Initial Calibration Verification |
| J | The quantitation is an estimation. |
| LCS(D) | Laboratory Control Spike (Duplicate) |
| LLQC/LLIQC | Low Level Quantitation Check |
| 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 |
| MB | Method Blank |
| MS(D) | Matrix Spike (Duplicate) |
| ND | Indicates the analyte is not detected. |
| RPD | Relative Percent Difference |
| TNTC | Too Numerous To Count |
| 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 |
|---|---|---|---|---|
| T2-01A | 1204107001 | 08/11/2020 | 08/11/2020 | Soil/Solid (dry weight) |
| T2-01B | 1204107002 | 08/11/2020 | 08/11/2020 | Soil/Solid (dry weight) |
| T2-03A | 1204107003 | 08/11/2020 | 08/11/2020 | Soil/Solid (dry weight) |
| T2-X | 1204107004 | 08/11/2020 | 08/11/2020 | Solid/Soil (Wet Weight) |
| Trip Blank | 1204107005 | 08/11/2020 | 08/11/2020 | Soil/Solid (dry weight) |

| Method | Method Description |
|---|---|
| AK101 | AK101/8021 Combo. (S) |
| SW8021B | AK101/8021 Combo. (S) |
| AK102 | Diesel/Residual Range Organics |
| AK103 | Diesel/Residual Range Organics |
| SM21 2540G | Percent Solids SM2540G |
| SW9060A-Mod | Total Organic Carbon-M in Soil |





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## Detectable Results Summary

Client Sample ID: **T2-01A**
Lab Sample ID: 1204107001

| Parameter | Result | Units |
|---|---|---|
| **Semivolatile Organic Fuels** | | |
| Diesel Range Organics | 616 | mg/kg |
| Residual Range Organics | 7070 | mg/kg |
| **Waters Department** | | |
| Total Organic Carbon | 36.0 | % |

Client Sample ID: **T2-01B**
Lab Sample ID: 1204107002

| Parameter | Result | Units |
|---|---|---|
| **Semivolatile Organic Fuels** | | |
| Diesel Range Organics | 449 | mg/kg |
| Residual Range Organics | 5980 | mg/kg |
| **Waters Department** | | |
| Total Organic Carbon | 35.7 | % |

Client Sample ID: **T2-03A**
Lab Sample ID: 1204107003

| Parameter | Result | Units |
|---|---|---|
| **Semivolatile Organic Fuels** | | |
| Diesel Range Organics | 702 | mg/kg |
| Residual Range Organics | 10600 | mg/kg |
| **Waters Department** | | |
| Total Organic Carbon | 42.6 | % |





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Results of **T2-01A**

Client Sample ID: **T2-01A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107001
Lab Project ID: 1204107

Collection Date: 08/11/20 10:35
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):22.5
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 616 | | 87.8 | 27.2 | mg/kg | 1 | | 08/31/20 07:08 |
| **Surrogates** | | | | | | | | |
| 5a Androstane (surr) | 106 | | 50-150 | | % | 1 | | 08/31/20 07:08 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 07:08
Container ID: 1204107001-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.409 g
Prep Extract Vol: 5 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Residual Range Organics | 7070 | | 439 | 189 | mg/kg | 1 | | 08/31/20 07:08 |
| **Surrogates** | | | | | | | | |
| n-Triacontane-d62 (surr) | 83.3 | | 50-150 | | % | 1 | | 08/31/20 07:08 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 07:08
Container ID: 1204107001-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.409 g
Prep Extract Vol: 5 mL





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## Results of **T2-01A**

Client Sample ID: **T2-01A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107001
Lab Project ID: 1204107

Collection Date: 08/11/20 10:35
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):22.5
Location:

## Results by **Volatile Fuels**

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 22.8 | U | 45.5 | 13.7 | mg/Kg | 1 | | 08/19/20 20:36 |
| **Surrogates** | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 157 | * | 50-150 | | % | 1 | | 08/19/20 20:36 |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/19/20 20:36
Container ID: 1204107001-B

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 10:35
Prep Initial Wt./Vol.: 19.688 g
Prep Extract Vol: 40.2648 mL

| Parameter | Result | Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | 114 | U | 228 | 72.8 | ug/kg | 1 | | 08/19/20 20:36 |
| Ethylbenzene | 228 | U | 455 | 142 | ug/kg | 1 | | 08/19/20 20:36 |
| o-Xylene | 228 | U | 455 | 142 | ug/kg | 1 | | 08/19/20 20:36 |
| P & M -Xylene | 455 | U | 910 | 273 | ug/kg | 1 | | 08/19/20 20:36 |
| Toluene | 228 | U | 455 | 142 | ug/kg | 1 | | 08/19/20 20:36 |
| Xylenes (total) | 685 | U | 1370 | 415 | ug/kg | 1 | | 08/19/20 20:36 |
| **Surrogates** | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 92.8 | | 72-119 | | % | 1 | | 08/19/20 20:36 |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/19/20 20:36
Container ID: 1204107001-B

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 10:35
Prep Initial Wt./Vol.: 19.688 g
Prep Extract Vol: 40.2648 mL





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Results of **T2-01A**

Client Sample ID: **T2-01A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107001
Lab Project ID: 1204107

Collection Date: 08/11/20 10:35
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):22.5
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 36.0 | 2.23 | 0.668 | % | 1 | | 08/15/20 15:50 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 15:50
Container ID: 1204107001-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 50 mg
Prep Extract Vol: 1 mL





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Results of **T2-01B**

Client Sample ID: **T2-01B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107002
Lab Project ID: 1204107

Collection Date: 08/11/20 10:50
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):23.1
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 449 | 86.0 | 26.7 | mg/kg | 1 | | 08/31/20 07:18 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 107 | 50-150 | | % | 1 | | 08/31/20 07:18 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 07:18
Container ID: 1204107002-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.211 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 5980 | 430 | 185 | mg/kg | 1 | | 08/31/20 07:18 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 88.7 | 50-150 | | % | 1 | | 08/31/20 07:18 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 07:18
Container ID: 1204107002-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.211 g
Prep Extract Vol: 5 mL





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Results of **T2-01B**

Client Sample ID: **T2-01B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107002
Lab Project ID: 1204107

Collection Date: 08/11/20 10:50
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):23.1
Location:

Results by **Volatile Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 25.8 U | 51.6 | 15.5 | mg/Kg | 1 | | 08/19/20 20:54 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 135 | 50-150 | | % | 1 | | 08/19/20 20:54 |

**Batch Information**

Analytical Batch: VFC15295
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/19/20 20:54
Container ID: 1204107002-B

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 10:50
Prep Initial Wt./Vol.: 15.487 g
Prep Extract Vol: 36.9092 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 129 U | 258 | 82.5 | ug/kg | 1 | | 08/19/20 20:54 |
| Ethylbenzene | 258 U | 516 | 161 | ug/kg | 1 | | 08/19/20 20:54 |
| o-Xylene | 258 U | 516 | 161 | ug/kg | 1 | | 08/19/20 20:54 |
| P & M -Xylene | 515 U | 1030 | 309 | ug/kg | 1 | | 08/19/20 20:54 |
| Toluene | 258 U | 516 | 161 | ug/kg | 1 | | 08/19/20 20:54 |
| Xylenes (total) | 775 U | 1550 | 470 | ug/kg | 1 | | 08/19/20 20:54 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 93.5 | 72-119 | | % | 1 | | 08/19/20 20:54 |

**Batch Information**

Analytical Batch: VFC15295
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/19/20 20:54
Container ID: 1204107002-B

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 10:50
Prep Initial Wt./Vol.: 15.487 g
Prep Extract Vol: 36.9092 mL





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Results of **T2-01B**

Client Sample ID: **T2-01B**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107002
Lab Project ID: 1204107

Collection Date: 08/11/20 10:50
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):23.1
Location:

Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 35.7 | 1.83 | 0.549 | % | 1 | | 08/15/20 15:58 |

**Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 15:58
Container ID: 1204107002-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 59.1 mg
Prep Extract Vol: 1 mL





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Results of **T2-03A**

Client Sample ID: **T2-03A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107003
Lab Project ID: 1204107

Collection Date: 08/11/20 11:30
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):27.2
Location:

Results by **Semivolatile Organic Fuels**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 702 | 73.0 | 22.6 | mg/kg | 1 | | 08/31/20 07:28 |
| **Surrogates** | | | | | | | |
| 5a Androstane (surr) | 89.9 | 50-150 | | % | 1 | | 08/31/20 07:28 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/31/20 07:28
Container ID: 1204107003-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.258 g
Prep Extract Vol: 5 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Residual Range Organics | 10600 | 365 | 157 | mg/kg | 1 | | 08/31/20 07:28 |
| **Surrogates** | | | | | | | |
| n-Triacontane-d62 (surr) | 75.1 | 50-150 | | % | 1 | | 08/31/20 07:28 |

**Batch Information**

Analytical Batch: XFC15711
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/31/20 07:28
Container ID: 1204107003-A

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 08/21/20 13:45
Prep Initial Wt./Vol.: 30.258 g
Prep Extract Vol: 5 mL





J flagging is activated

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## Results of T2-03A

Client Sample ID: **T2-03A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107003
Lab Project ID: 1204107

Collection Date: 08/11/20 11:30
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):27.2
Location:

## Results by Volatile Fuels

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 21.9 U | 43.7 | 13.1 | mg/Kg | 1 | | 08/19/20 21:12 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 121 | 50-150 | | % | 1 | | 08/19/20 21:12 |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/19/20 21:12
Container ID: 1204107003-B

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 11:30
Prep Initial Wt./Vol.: 15.205 g
Prep Extract Vol: 36.0742 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 109 U | 218 | 69.9 | ug/kg | 1 | | 08/19/20 21:12 |
| Ethylbenzene | 219 U | 437 | 136 | ug/kg | 1 | | 08/19/20 21:12 |
| o-Xylene | 219 U | 437 | 136 | ug/kg | 1 | | 08/19/20 21:12 |
| P & M -Xylene | 437 U | 873 | 262 | ug/kg | 1 | | 08/19/20 21:12 |
| Toluene | 219 U | 437 | 136 | ug/kg | 1 | | 08/19/20 21:12 |
| Xylenes (total) | 655 U | 1310 | 398 | ug/kg | 1 | | 08/19/20 21:12 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.4 | 72-119 | | % | 1 | | 08/19/20 21:12 |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/19/20 21:12
Container ID: 1204107003-B

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 11:30
Prep Initial Wt./Vol.: 15.205 g
Prep Extract Vol: 36.0742 mL

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## Results of **T2-03A**

Client Sample ID: **T2-03A**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107003
Lab Project ID: 1204107

Collection Date: 08/11/20 11:30
Received Date: 08/11/20 13:17
Matrix: Soil/Solid (dry weight)
Solids (%):27.2
Location:

## Results by **Waters Department**

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Total Organic Carbon | 42.6 | 1.80 | 0.540 | % | 1 | | 08/15/20 16:05 |

### **Batch Information**

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Analyst: EWW
Analytical Date/Time: 08/15/20 16:05
Container ID: 1204107003-A

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 08/15/20 10:30
Prep Initial Wt./Vol.: 51.1 mg
Prep Extract Vol: 1 mL

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## Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **20-2176 CRW Postmark Bog V2**
Lab Sample ID: 1204107005
Lab Project ID: 1204107

Collection Date: 08/11/20 10:35
Received Date: 08/11/20 13:17
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 | 1.25 U | 2.51 | 0.752 | mg/Kg | 1 | | 08/19/20 20:19 |
| **Surrogates** | | | | | | | |
| 4-Bromofluorobenzene (surr) | 144 | 50-150 | | % | 1 | | 08/19/20 20:19 |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/19/20 20:19
Container ID: 1204107005-A

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 10:35
Prep Initial Wt./Vol.: 49.845 g
Prep Extract Vol: 25 mL

| Parameter | Result Qual | LOQ/CL | DL | Units | DF | Allowable Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Benzene | 6.25 U | 12.5 | 4.01 | ug/kg | 1 | | 08/19/20 20:19 |
| Ethylbenzene | 12.6 U | 25.1 | 7.82 | ug/kg | 1 | | 08/19/20 20:19 |
| o-Xylene | 12.6 U | 25.1 | 7.82 | ug/kg | 1 | | 08/19/20 20:19 |
| P & M -Xylene | 25.1 U | 50.2 | 15.0 | ug/kg | 1 | | 08/19/20 20:19 |
| Toluene | 12.6 U | 25.1 | 7.82 | ug/kg | 1 | | 08/19/20 20:19 |
| Xylenes (total) | 37.6 U | 75.2 | 22.9 | ug/kg | 1 | | 08/19/20 20:19 |
| **Surrogates** | | | | | | | |
| 1,4-Difluorobenzene (surr) | 94.6 | 72-119 | | % | 1 | | 08/19/20 20:19 |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/19/20 20:19
Container ID: 1204107005-A

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 08/11/20 10:35
Prep Initial Wt./Vol.: 49.845 g
Prep Extract Vol: 25 mL





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## Method Blank

Blank ID: MB for HBN 1810708 [SPT/11110]
Blank Lab ID: 1576530

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204107001, 1204107002, 1204107003

### Results by **SM21 2540G**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Solids | 100 | | | % |

### Batch Information

Analytical Batch: SPT11110
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M
Analytical Date/Time: 8/21/2020 4:50:00PM





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## Duplicate Sample Summary

Original Sample ID: 1204200001
Duplicate Sample ID: 1576531

Analysis Date: 08/21/2020 16:50
Matrix: Soil/Solid (dry weight)

QC for Samples:

1204107001, 1204107002, 1204107003

## Results by **SM21 2540G**

| NAME | Original | Duplicate | Units | RPD (%) | RPD CL |
|---|---|---|---|---|---|
| Total Solids | 78.4 | 78.7 | % | 0.34 | (< 15 ) |

## Batch Information

Analytical Batch: SPT11110
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M





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## Method Blank

Blank ID: MB for HBN 1810608 [VXX/36168]
Blank Lab ID: 1576025

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204107001, 1204107002, 1204107003, 1204107005

## Results by **AK101**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Gasoline Range Organics | 1.25U | 2.50 | 0.750 | mg/Kg |
| **Surrogates** | | | | |
| 4-Bromofluorobenzene (surr) | 102 | 50-150 | | % |

## Batch Information

Analytical Batch: VFC15295
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/19/2020 8:01:00PM

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 8/19/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204107 [VXX36168]
Blank Spike Lab ID: 1576026
Date Analyzed: 08/19/2020 18:50

Spike Duplicate ID: LCSD for HBN 1204107 [VXX36168]
Spike Duplicate Lab ID: 1576027
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003, 1204107005

## 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 | 12.5 | 14.1 | 113 | 12.5 | 14.0 | 112 | ( 60-120 ) | 0.99 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 4-Bromofluorobenzene (surr) | 1.25 | 106 | 106 | 1.25 | 108 | 108 | ( 50-150 ) | 2.10 | |

## Batch Information

Analytical Batch: **VFC15295**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36168**
Prep Method: **SW5035A**
Prep Date/Time: **08/19/2020 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL





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**Method Blank**

Blank ID: MB for HBN 1810608 [VXX/36168]
Blank Lab ID: 1576025

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204107001, 1204107002, 1204107003, 1204107005

Results by **SW8021B**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Benzene | 6.25U | 12.5 | 4.00 | ug/kg |
| Ethylbenzene | 12.5U | 25.0 | 7.80 | ug/kg |
| o-Xylene | 12.5U | 25.0 | 7.80 | ug/kg |
| P & M -Xylene | 25.0U | 50.0 | 15.0 | ug/kg |
| Toluene | 12.5U | 25.0 | 7.80 | ug/kg |
| Xylenes (total) | 37.5U | 75.0 | 22.8 | ug/kg |
| **Surrogates** | | | | |
| 1,4-Difluorobenzene (surr) | 101 | 72-119 | | % |

**Batch Information**

Analytical Batch: VFC15295
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/19/2020 8:01:00PM

Prep Batch: VXX36168
Prep Method: SW5035A
Prep Date/Time: 8/19/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204107 [VXX36168]
Blank Spike Lab ID: 1576028
Date Analyzed: 08/19/2020 19:43

Spike Duplicate ID: LCSD for HBN 1204107 [VXX36168]
Spike Duplicate Lab ID: 1576029
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003, 1204107005

## Results by **SW8021B**

| | Blank Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 1250 | 1320 | 106 | 1250 | 1300 | 104 | ( 75-125 ) | 1.20 | (< 20 ) |
| Ethylbenzene | 1250 | 1260 | 101 | 1250 | 1250 | 100 | ( 75-125 ) | 0.60 | (< 20 ) |
| o-Xylene | 1250 | 1310 | 105 | 1250 | 1310 | 104 | ( 75-125 ) | 0.73 | (< 20 ) |
| P & M -Xylene | 2500 | 2600 | 104 | 2500 | 2580 | 103 | ( 80-125 ) | 0.90 | (< 20 ) |
| Toluene | 1250 | 1210 | 97 | 1250 | 1230 | 98 | ( 70-125 ) | 1.20 | (< 20 ) |
| Xylenes (total) | 3750 | 3910 | 104 | 3750 | 3880 | 104 | ( 78-124 ) | 0.84 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | 1250 | 103 | 103 | 1250 | 104 | 104 | ( 72-119 ) | 0.98 | |

## Batch Information

Analytical Batch: **VFC15295**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36168**
Prep Method: **SW5035A**
Prep Date/Time: **08/19/2020 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL





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## Matrix Spike Summary

Original Sample ID: 1576032
MS Sample ID: 1576030 MS
MSD Sample ID: 1576031 MSD

Analysis Date: 08/19/2020 22:05
Analysis Date: 08/19/2020 22:23
Analysis Date: 08/19/2020 22:40
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003, 1204107005

## Results by **SW8021B**

| | | Matrix Spike (ug/kg) | | | Spike Duplicate (ug/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Benzene | 9.81 | 377 | 435 | 113 | 377 | 434 | 112 | 75-125 | 0.12 | (< 20 ) |
| Ethylbenzene | 3.77U | 377 | 419 | 111 | 377 | 420 | 111 | 75-125 | 0.05 | (< 20 ) |
| o-Xylene | 3.77U | 377 | 417 | 111 | 377 | 415 | 110 | 75-125 | 0.62 | (< 20 ) |
| P & M -Xylene | 7.55U | 755 | 856 | 113 | 755 | 853 | 113 | 80-125 | 0.32 | (< 20 ) |
| Toluene | 3.25J | 377 | 418 | 110 | 377 | 413 | 109 | 70-125 | 1.40 | (< 20 ) |
| Xylenes (total) | 11.3U | 1130 | 1270 | 112 | 1130 | 1270 | 112 | 78-124 | 0.42 | (< 20 ) |
| **Surrogates** | | | | | | | | | | |
| 1,4-Difluorobenzene (surr) | | 377 | 370 | 98 | 377 | 370 | 98 | 72-119 | 0.12 | |

### Batch Information

Analytical Batch: VFC15295
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 8/19/2020 10:23:00PM

Prep Batch: VXX36168
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/19/2020 6:00:00AM
Prep Initial Wt./Vol.: 165.64g
Prep Extract Vol: 25.00mL





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## Method Blank

Blank ID: MB for HBN 1810348 [WXX/13402]
Blank Lab ID: 1574911

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204107001, 1204107002, 1204107003

## Results by **SW9060A-Mod**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Total Organic Carbon | 0.0250U | 0.0500 | 0.0150 | % |

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 2:44:42PM

Prep Batch: WXX13402
Prep Method: METHOD
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 500 mg
Prep Extract Vol: 1 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204107 [WXX13402]
Blank Spike Lab ID: 1574912
Date Analyzed: 08/15/2020 14:59

Spike Duplicate ID: LCSD for HBN 1204107 [WXX13402]
Spike Duplicate Lab ID: 1574913
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003

## Results by SW9060A-Mod

| | Blank Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 3.35 | 3.21 | 96 | 3.35 | 3.18 | 95 | ( 75-125 ) | 0.94 | (< 25 ) |

## Batch Information

Analytical Batch: **WTC3027**
Analytical Method: **SW9060A-Mod**
Instrument: **TOC Analyzer 2**
Analyst: **EWW**

Prep Batch: **WXX13402**
Prep Method: **METHOD**
Prep Date/Time: **08/15/2020 10:30**
Spike Init Wt./Vol.: 3.35 % Extract Vol: 1 mL
Dupe Init Wt./Vol.: 3.35 % Extract Vol: 1 mL





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## Matrix Spike Summary

Original Sample ID: 1204074006
MS Sample ID: 1574914 MS
MSD Sample ID:

Analysis Date: 08/15/2020 15:20
Analysis Date: 08/15/2020 15:28
Analysis Date:
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003

## Results by **SW9060A-Mod**

| | | Matrix Spike (%) | | | Spike Duplicate (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Sample | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Total Organic Carbon | 45.1 | 14.1 | 57.0 | 85 | | | | 75-125 | | |

## Batch Information

Analytical Batch: WTC3027
Analytical Method: SW9060A-Mod
Instrument: TOC Analyzer 2
Analyst: EWW
Analytical Date/Time: 8/15/2020 3:28:50PM

Prep Batch: WXX13402
Prep Method: TOC Soils Prep (S)
Prep Date/Time: 8/15/2020 10:30:00AM
Prep Initial Wt./Vol.: 44.70mg
Prep Extract Vol: 1.00mL





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## Method Blank

Blank ID: MB for HBN 1810653 [XXX/43711]
Blank Lab ID: 1576257

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204107001, 1204107002, 1204107003

## Results by **AK102**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Diesel Range Organics | 10.0U | 20.0 | 6.20 | mg/kg |
| **Surrogates** | | | | |
| 5a Androstane (surr) | 106 | 60-120 | | % |

## Batch Information

Analytical Batch: XFC15711
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/31/2020 6:08:00AM

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 8/21/2020 1:45:08PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204107 [XXX43711]
Blank Spike Lab ID: 1576258
Date Analyzed: 08/31/2020 06:18

Spike Duplicate ID: LCSD for HBN 1204107 [XXX43711]
Spike Duplicate Lab ID: 1576259
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003

## 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 | 833 | 788 | 95 | 833 | 733 | 88 | ( 75-125 ) | 7.30 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| 5a Androstane (surr) | 16.7 | 122 | 122 * | 16.7 | 113 | 113 | ( 60-120 ) | 8.10 | |

## Batch Information

Analytical Batch: **XFC15711**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43711**
Prep Method: **SW3550C**
Prep Date/Time: **08/21/2020 13:45**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL





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## Method Blank

Blank ID: MB for HBN 1810653 [XXX/43711]
Blank Lab ID: 1576257

Matrix: Soil/Solid (dry weight)

QC for Samples:
1204107001, 1204107002, 1204107003

## Results by **AK103**

| Parameter | Results | LOQ/CL | DL | Units |
|---|---|---|---|---|
| Residual Range Organics | 50.0U | 100 | 43.0 | mg/kg |
| **Surrogates** | | | | |
| n-Triacontane-d62 (surr) | 103 | 60-120 | | % |

## Batch Information

Analytical Batch: XFC15711
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: CDM
Analytical Date/Time: 8/31/2020 6:08:00AM

Prep Batch: XXX43711
Prep Method: SW3550C
Prep Date/Time: 8/21/2020 1:45:08PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL





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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1204107 [XXX43711]
Blank Spike Lab ID: 1576258
Date Analyzed: 08/31/2020 06:18

Spike Duplicate ID: LCSD for HBN 1204107 [XXX43711]
Spike Duplicate Lab ID: 1576259
Matrix: Soil/Solid (dry weight)

QC for Samples: 1204107001, 1204107002, 1204107003

## Results by **AK103**

| | Blank Spike (mg/kg) | | | Spike Duplicate (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | Spike | Result | Rec (%) | Spike | Result | Rec (%) | CL | RPD (%) | RPD CL |
| Residual Range Organics | 833 | 763 | 92 | 833 | 705 | 85 | ( 60-120 ) | 7.90 | (< 20 ) |
| **Surrogates** | | | | | | | | | |
| n-Triacontane-d62 (surr) | 16.7 | 110 | 110 | 16.7 | 106 | 106 | ( 60-120 ) | 3.30 | |

## Batch Information

Analytical Batch: **XFC15711**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **CDM**

Prep Batch: **XXX43711**
Prep Method: **SW3550C**
Prep Date/Time: **08/21/2020 13:45**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

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## CHAIN OF CUSTODY RECORD

1204107

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**Instructions:** Sections 1 - 5 must be filled out. **Omissions may delay the onset of analysis.**

Page 1 of 1

**Section 1**

CLIENT: RSE

CONTACT: Kyle Wiseman — PHONE #: 278-1023

PROJECT NAME: CRW Postmark Bog V2 — PROJECT/PWSID/PERMIT#: 20-2176

REPORTS TO: RSE — E-MAIL: kwiseman@restorsci.com — Profile #:

INVOICE TO: RSE — QUOTE #: — P.O. #: #364091 SAD

**Section 3** — Preservative

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

**Section 2**

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HH:MM | MATRIX/ MATRIX CODE | # CONTAINERS | Comp Grab MI (Multi-incremental) | PFAS | DRO/RRO | TOC | GRO/BTEX | | | | | | | REMARKS/LOC ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1AC | T2-01A | 8/11/2020 | 10:35 | SOIL | 3 | G | X | X | X | X | | | | | | | HOLD DRO, RRO, GRO TOC, BTEX |
| 2AC | T2-01B | 8/11/2020 | 10:58 | SOIL | 3 | G | X | X | X | X | | | | | | | |
| 3AC | T2-03A | 8/11/2020 | 11:30 | SOIL | 3 | G | X | X | X | X | | | | | | | |
| 4A | T2-X | 8/11/2020 | 10:40 | SOIL | 1 | G | X | | | | | | | | | | |
| 5A | | | | | | | | | | | | | | | | | |

**Section 5**

| Relinquished By: (1) | Date | Time | Received By: |
|---|---|---|---|
| [signature] | 8/11/20 | 1250 | |
| Relinquished By: (2) | Date | Time | Received By: |
| Relinquished By: (3) | Date | Time | Received By: |
| Relinquished By: (4) | Date | Time | Received For Laboratory By: |
| | 8/11/20 | 13:17 | [signature] RJC |

**Section 4** — DOD Project? Yes No — Data Deliverable Requirements: REGULAR

Cooler ID: 8/11/20

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 3.0 D50 — or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

http://www.sgs.com/terms-and-conditions

F083-Blank_COC_20181228

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# e-Sample Receipt Form

**SGS Workorder #:** **1204107** | 1204107

| Review Criteria | Condition (Yes, No, N/A) | Exceptions Noted below |
|---|---|---|
| **Chain of Custody / Temperature Requirements** | Yes | Exemption permitted if sampler hand carries/delivers. |
| Were Custody Seals intact? Note # & location | N/A | |
| COC accompanied samples? | Yes | |
| DOD: Were samples received in COC corresponding coolers? | N/A | |
| | Yes | **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required |
| Temperature blank compliant* (i.e., 0-6 °C after CF)? | Yes | Cooler ID: 1 @ 3.0 °C Therm. ID: D50 |
| If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available. | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| **If >6°C, were samples collected <8 hours ago?* | N/A | |
| If <0°C, were sample containers ice free? | N/A | |
| Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed. | | |
| **Holding Time / Documentation / Sample Condition Requirements** | | Note: Refer to form F-083 "Sample Guide" for specific holding times. |
| Were samples received within holding time? | Yes | |
| Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information | Yes | |
| Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals) | Yes | |
| | N/A | ***Exemption permitted for metals (e.g,200.8/6020A). |
| Were proper containers (type/mass/volume/preservative***)used? | Yes | |
| **Volatile / LL-Hg Requirements** | | |
| Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? | Yes | |
| Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? | N/A | |
| Were all soil VOAs field extracted with MeOH+BFB? | Yes | |

**Note to Client:** Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

## Sample Containers and Preservatives

| Container Id | Preservative | Container Condition | Container Id | Preservative | Container Condition |
|---|---|---|---|---|---|
| 1204107001-A | No Preservative Required | OK | | | |
| 1204107001-B | Methanol field pres. 4 C | OK | | | |
| 1204107001-C | No Preservative Required | OK | | | |
| 1204107002-A | No Preservative Required | OK | | | |
| 1204107002-B | Methanol field pres. 4 C | OK | | | |
| 1204107002-C | No Preservative Required | OK | | | |
| 1204107003-A | No Preservative Required | OK | | | |
| 1204107003-B | Methanol field pres. 4 C | OK | | | |
| 1204107003-C | No Preservative Required | OK | | | |
| 1204107004-A | No Preservative Required | OK | | | |
| 1204107005-A | Methanol field pres. 4 C | OK | | | |



Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
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.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*
*Automated Report*

# Technical Report for

SGS North America, Inc

1204107

SGS Job Number: FA77769

Sampling Date: 08/11/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: **31**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV


Test results relate only to samples analyzed.

Sections: 1 2 3 4 5 6

# Table of Contents

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# Sample Summary

SGS North America, Inc

1204107

**Job No:** FA77769

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| FA77769-1 | 08/11/20 | 10:35 | | 08/13/20 | SO | Soil | T2-01A |
| FA77769-2 | 08/11/20 | 10:50 | | 08/13/20 | SO | Soil | T2-01B |
| FA77769-3 | 08/11/20 | 11:30 | | 08/13/20 | SO | Soil | T2-03A |
| FA77769-4 | 08/11/20 | 10:40 | | 08/13/20 | SO | Soil | T2-X |



Soil samples reported on a dry weight basis unless otherwise indicated on result page.

# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** SGS North America, Inc **Job No:** FA77769

**Site:** 1204107 **Report Date** 8/28/2020 12:29:17

4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 08/11/2020 and were received at SGS North America Inc - Orlando on 08/13/2020 properly preserved, at 3 Deg. C and intact. These Samples received an SGS Orlando job number of FA77769. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

## MS Semi-volatiles By Method EPA 537M QSM5.3 B-15

**Matrix:** SO **Batch ID:** OP81627

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA77769-4MS, FA77769-4MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Matrix Spike Recovery(s) for Perfluorooctanesulfonic acid are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Matrix Spike Duplicate Recovery(s) for Perfluorooctanesulfonic acid are outside control limits. Probable cause is due to matrix interference.

Sample(s) FA77769-1, FA77769-2, FA77769-3, FA77769-4 have surrogates outside control limits.

FA77769-1: Dilution required due to matrix interference (ID recovery standard failure).

FA77769-1 for 4:2 Fluorotelomer sulfonate: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77769-1 for 13C2-4:2FTS: Outside control limits due to matrix interference.

FA77769-1 for 13C5-PFPeA: Outside control limits due to matrix interference.

FA77769-1 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77769-1 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77769-1 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77769-1 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77769-1 for 13C5-PFHxA: Outside control limits due to matrix interference.

FA77769-1 for 13C4-PFHpA: Outside control limits due to matrix interference.

FA77769-1 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77769-1 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77769-1 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77769-1 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77769-2 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77769-2 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77769-2 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77769-2: Dilution required due to matrix interference (ID recovery standard failure).

FA77769-2 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77769-3 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77769-3 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77769-3 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77769-3 for 13C6-PFDA: Outside control limits due to matrix interference.

FA77769-3 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA77769-3 for 13C8-FOSA: Outside control limits due to matrix interference.

FA77769-3 for 13C9-PFNA: Outside control limits due to matrix interference.

FA77769-3 for d3-MeFOSAA: Outside control limits due to matrix interference.

FA77769-3 for PFOSA: Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.

FA77769-3: Dilution required due to matrix interference (ID recovery standard failure).

FA77769-4 for 13C2-8:2FTS: Outside control limits due to matrix interference.

FA77769-4 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA77769-4 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA77769-4 for 13C6-PFDA: Outside control limits due to matrix interference.
FA77769-4 for 13C7-PFUnDA: Outside control limits due to matrix interference.
FA77769-4 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77769-4 for 13C8-FOSA: Outside control limits due to matrix interference.
FA77769-4 for d3-MeFOSAA: Outside control limits due to matrix interference.
FA77769-4 for PFOSA: Associated ID Standard outside control limits, Confirmed by batch QC.
FA77769-4: Dilution required due to matrix interference (ID recovery standard failure).
OP81627-MS for 13C7-PFUnDA: Outside control limits due to matrix interference.
OP81627-MS for 13C8-FOSA: Outside control limits due to matrix interference.
OP81627-MS for 13C6-PFDA: Outside control limits due to matrix interference.
OP81627-MS for 13C2-PFTeDA: Outside control limits due to matrix interference.
OP81627-MS for 13C2-PFDoDA: Outside control limits due to matrix interference.
OP81627-MS for 13C2-8:2FTS: Outside control limits due to matrix interference.
OP81627-MS for d3-MeFOSAA: Outside control limits due to matrix interference.
OP81627-MSD for 13C8-FOSA: Outside control limits due to matrix interference.
OP81627-MSD for 13C6-PFDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C2-PFTeDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C2-PFDoDA: Outside control limits due to matrix interference.
OP81627-MSD for 13C2-8:2FTS: Outside control limits due to matrix interference.
OP81627-MSD for 13C7-PFUnDA: Outside control limits due to matrix interference.
OP81627-MSD for d3-MeFOSAA: Outside control limits due to matrix interference.

## General Chemistry By Method SM19 2540G

**Matrix:** SO **Batch ID:** GN85944

Sample(s) FA77773-1DUP were used as the QC samples for Solids, Percent.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

________________________________________

Ariel Hartney, Client Services *(Signature on file)*

# Summary of Hits

**Job Number:** FA77769
**Account:** SGS North America, Inc
**Project:** 1204107
**Collected:** 08/11/20



| Lab Sample ID / Analyte | Client Sample ID | Result/ Qual | LOQ | LOD | Units | Method |
|---|---|---|---|---|---|---|
| **FA77769-1** | **T2-01A** | | | | | |
| Perfluorooctanoic acid | | 0.0017 J | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0063 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0743 | 0.0044 | 0.0022 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77769-2** | **T2-01B** | | | | | |
| Perfluorooctanesulfonic acid | | 0.0056 | 0.0052 | 0.0026 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77769-3** | **T2-03A** | | | | | |
| Perfluoropentanoic acid | | 0.00085 J | 0.0029 | 0.0015 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0011 J | 0.0029 | 0.0015 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0012 J | 0.0029 | 0.0015 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0011 J | 0.0029 | 0.0015 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0055 | 0.0029 | 0.0015 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0095 | 0.0029 | 0.0015 | mg/kg | EPA 537M QSM5.3 B-15 |
| **FA77769-4** | **T2-X** | | | | | |
| Perfluoropentanoic acid | | 0.0014 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanoic acid | | 0.0022 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluoroheptanoic acid | | 0.0015 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanoic acid | | 0.0017 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorononanoic acid | | 0.0012 J | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorohexanesulfonic acid | | 0.0069 | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |
| Perfluorooctanesulfonic acid | | 0.0777 | 0.0035 | 0.0017 | mg/kg | EPA 537M QSM5.3 B-15 |

## Sample Results

## Report of Analysis

SGS North America Inc.

# Report of Analysis



**Client Sample ID:** T2-01A
**Lab Sample ID:** FA77769-1 **Date Sampled:** 08/11/20
**Matrix:** SO - Soil **Date Received:** 08/13/20
**Method:** EPA 537M QSM5.3 B-15 IN HOUSE **Percent Solids:** 20.9
**Project:** 1204107

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5129.D | 1 | 08/21/20 22:11 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5080.D | 10 | 08/21/20 02:30 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.19 g | 1.0 ml |
| Run #2 | 2.19 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.0087 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.0087 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0017 | 0.0044 | 0.0022 | 0.0011 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid [c] | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0063 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0743 | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.044 U [b] | 0.11 | 0.044 | 0.022 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.044 U [b] | 0.11 | 0.044 | 0.022 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate [c] | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0022 U | 0.0044 | 0.0022 | 0.0011 | mg/kg | |

U = Not detected    LOD = Limit of Detection    J = Indicates an estimated value
LOQ = Limit of Quantitation    DL = Detection Limit    B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range    N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T2-01A | | |
| **Lab Sample ID:** | FA77769-1 | **Date Sampled:** | 08/11/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/13/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 20.9 |
| **Project:** | 1204107 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.022 U [b] | 0.044 | 0.022 | 0.011 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 56% | 54% | 50-150% |
| | 13C5-PFPeA | 47% [d] | 53% | 50-150% |
| | 13C5-PFHxA | 48% [d] | 54% | 50-150% |
| | 13C4-PFHpA | 48% [d] | 55% | 50-150% |
| | 13C8-PFOA | 51% | 58% | 50-150% |
| | 13C9-PFNA | 46% [d] | 56% | 50-150% |
| | 13C6-PFDA | 37% [d] | 55% | 50-150% |
| | 13C7-PFUnDA | 38% [d] | 50% | 50-150% |
| | 13C2-PFDoDA | 28% [d] | 49% [d] | 50-150% |
| | 13C2-PFTeDA | 44% [d] | 50% | 50-150% |
| | 13C3-PFBS | 53% | 58% | 50-150% |
| | 13C3-PFHxS | 55% | 55% | 50-150% |
| | 13C8-PFOS | 56% | 56% | 50-150% |
| | 13C8-FOSA | 19% [d] | 48% [d] | 50-150% |
| | d3-MeFOSAA | 38% [d] | 54% | 50-150% |
| | 13C2-4:2FTS | 48% [d] | 49% [d] | 50-150% |
| | 13C2-6:2FTS | 53% | 55% | 50-150% |
| | 13C2-8:2FTS | 42% [d] | 52% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



**Client Sample ID:** T2-01B
**Lab Sample ID:** FA77769-2 **Date Sampled:** 08/11/20
**Matrix:** SO - Soil **Date Received:** 08/13/20
**Method:** EPA 537M QSM5.3 B-15 IN HOUSE **Percent Solids:** 16.6
**Project:** 1204107

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5130.D | 1 | 08/21/20 22:26 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5081.D | 10 | 08/21/20 02:46 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.33 g | 1.0 ml |
| Run #2 | 2.33 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0010 | mg/kg | |
| 307-24-4 | Perfluorohexanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0010 | mg/kg | |
| 375-85-9 | Perfluoroheptanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 335-67-1 | Perfluorooctanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 375-95-1 | Perfluorononanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.026 U [b] | 0.052 | 0.026 | 0.013 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.026 U [b] | 0.052 | 0.026 | 0.013 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.026 U [b] | 0.052 | 0.026 | 0.013 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0056 | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA | 0.026 U [b] | 0.052 | 0.026 | 0.013 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.052 U [b] | 0.13 | 0.052 | 0.026 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.052 U [b] | 0.13 | 0.052 | 0.026 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T2-01B | | |
| **Lab Sample ID:** | FA77769-2 | **Date Sampled:** | 08/11/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/13/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 16.6 |
| **Project:** | 1204107 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.0026 U | 0.0052 | 0.0026 | 0.0013 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 68% | 68% | 50-150% |
| | 13C5-PFPeA | 63% | 66% | 50-150% |
| | 13C5-PFHxA | 66% | 69% | 50-150% |
| | 13C4-PFHpA | 64% | 70% | 50-150% |
| | 13C8-PFOA | 66% | 73% | 50-150% |
| | 13C9-PFNA | 60% | 69% | 50-150% |
| | 13C6-PFDA | 48% [c] | 68% | 50-150% |
| | 13C7-PFUnDA | 50% | 62% | 50-150% |
| | 13C2-PFDoDA | 51% | 65% | 50-150% |
| | 13C2-PFTeDA | 49% [c] | 61% | 50-150% |
| | 13C3-PFBS | 72% | 74% | 50-150% |
| | 13C3-PFHxS | 72% | 75% | 50-150% |
| | 13C8-PFOS | 69% | 71% | 50-150% |
| | 13C8-FOSA | 26% [c] | 55% | 50-150% |
| | d3-MeFOSAA | 48% [c] | 64% | 50-150% |
| | 13C2-4:2FTS | 64% | 65% | 50-150% |
| | 13C2-6:2FTS | 68% | 69% | 50-150% |
| | 13C2-8:2FTS | 53% | 65% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

SGS North America Inc.

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T2-03A | | |
| **Lab Sample ID:** | FA77769-3 | **Date Sampled:** | 08/11/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/13/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 28.5 |
| **Project:** | 1204107 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5131.D | 1 | 08/21/20 22:42 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5082.D | 10 | 08/21/20 03:01 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.40 g | 1.0 ml |
| Run #2 | 2.40 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.00085 | 0.0029 | 0.0015 | 0.00058 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0011 | 0.0029 | 0.0015 | 0.00058 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0012 | 0.0029 | 0.0015 | 0.00073 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0011 | 0.0029 | 0.0015 | 0.00073 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| 335-76-2 | Perfluorodecanoic acid | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0055 | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0095 | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.029 U [b] | 0.073 | 0.029 | 0.015 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.029 U [b] | 0.073 | 0.029 | 0.015 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0015 U | 0.0029 | 0.0015 | 0.00073 | mg/kg | |

U = Not detected     LOD = Limit of Detection     J = Indicates an estimated value
LOQ = Limit of Quantitation     DL = Detection Limit     B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range     N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T2-03A | | |
| **Lab Sample ID:** | FA77769-3 | **Date Sampled:** | 08/11/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/13/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 28.5 |
| **Project:** | 1204107 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.015 U [b] | 0.029 | 0.015 | 0.0073 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 64% | 63% | 50-150% |
| | 13C5-PFPeA | 59% | 61% | 50-150% |
| | 13C5-PFHxA | 58% | 62% | 50-150% |
| | 13C4-PFHpA | 55% | 63% | 50-150% |
| | 13C8-PFOA | 55% | 65% | 50-150% |
| | 13C9-PFNA | 47% [d] | 61% | 50-150% |
| | 13C6-PFDA | 41% [d] | 62% | 50-150% |
| | 13C7-PFUnDA | 40% [d] | 57% | 50-150% |
| | 13C2-PFDoDA | 39% [d] | 58% | 50-150% |
| | 13C2-PFTeDA | 28% [d] | 55% | 50-150% |
| | 13C3-PFBS | 67% | 67% | 50-150% |
| | 13C3-PFHxS | 64% | 67% | 50-150% |
| | 13C8-PFOS | 58% | 66% | 50-150% |
| | 13C8-FOSA | 18% [d] | 49% [d] | 50-150% |
| | d3-MeFOSAA | 44% [d] | 55% | 50-150% |
| | 13C2-4:2FTS | 58% | 60% | 50-150% |
| | 13C2-6:2FTS | 58% | 64% | 50-150% |
| | 13C2-8:2FTS | 46% [d] | 65% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(d) Outside control limits due to matrix interference.



U = Not detected  LOD = Limit of Detection  J = Indicates an estimated value
LOQ = Limit of Quantitation  DL = Detection Limit  B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range  N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | T2-X | | |
| **Lab Sample ID:** | FA77769-4 | **Date Sampled:** | 08/11/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/13/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 23.9 |
| **Project:** | 1204107 | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4Q5132.D | 1 | 08/21/20 22:57 | NG | 08/19/20 11:00 | OP81627 | S4Q71 |
| Run #2 [a] | 4Q5083.D | 10 | 08/21/20 03:17 | NAF | 08/19/20 11:00 | OP81627 | S4Q70 |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 2.41 g | 1.0 ml |
| Run #2 | 2.41 g | 1.0 ml |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| **PERFLUOROALKYLCARBOXYLIC ACIDS** | | | | | | | |
| 375-22-4 | Perfluorobutanoic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 2706-90-3 | Perfluoropentanoic acid | 0.0014 | 0.0035 | 0.0017 | 0.00069 | mg/kg | J |
| 307-24-4 | Perfluorohexanoic acid | 0.0022 | 0.0035 | 0.0017 | 0.00069 | mg/kg | J |
| 375-85-9 | Perfluoroheptanoic acid | 0.0015 | 0.0035 | 0.0017 | 0.00087 | mg/kg | J |
| 335-67-1 | Perfluorooctanoic acid | 0.0017 | 0.0035 | 0.0017 | 0.00087 | mg/kg | J |
| 375-95-1 | Perfluorononanoic acid | 0.0012 | 0.0035 | 0.0017 | 0.00087 | mg/kg | J |
| 335-76-2 | Perfluorodecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 307-55-1 | Perfluorododecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROALKYLSULFONATES** | | | | | | | |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0069 | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0777 | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDES** | | | | | | | |
| 754-91-6 | PFOSA [c] | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | |
| 2355-31-9 | MeFOSAA | 0.035 U [b] | 0.087 | 0.035 | 0.017 | mg/kg | |
| 2991-50-6 | EtFOSAA | 0.035 U [b] | 0.087 | 0.035 | 0.017 | mg/kg | |
| **FLUOROTELOMER SULFONATES** | | | | | | | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0017 U | 0.0035 | 0.0017 | 0.00087 | mg/kg | |

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | T2-X | | |
| **Lab Sample ID:** | FA77769-4 | **Date Sampled:** | 08/11/20 |
| **Matrix:** | SO - Soil | **Date Received:** | 08/13/20 |
| **Method:** | EPA 537M QSM5.3 B-15 IN HOUSE | **Percent Solids:** | 23.9 |
| **Project:** | 1204107 | | |

| CAS No. | Compound | Result | LOQ | LOD | DL | Units | Q |
|---|---|---|---|---|---|---|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.017 U [b] | 0.035 | 0.017 | 0.0087 | mg/kg | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| | 13C4-PFBA | 61% | 61% | 50-150% |
| | 13C5-PFPeA | 50% | 59% | 50-150% |
| | 13C5-PFHxA | 51% | 62% | 50-150% |
| | 13C4-PFHpA | 51% | 62% | 50-150% |
| | 13C8-PFOA | 55% | 65% | 50-150% |
| | 13C9-PFNA | 51% | 62% | 50-150% |
| | 13C6-PFDA | 41% [d] | 62% | 50-150% |
| | 13C7-PFUnDA | 44% [d] | 55% | 50-150% |
| | 13C2-PFDoDA | 34% [d] | 52% | 50-150% |
| | 13C2-PFTeDA | 25% [d] | 50% | 50-150% |
| | 13C3-PFBS | 56% | 63% | 50-150% |
| | 13C3-PFHxS | 59% | 67% | 50-150% |
| | 13C8-PFOS | 61% | 61% | 50-150% |
| | 13C8-FOSA | 15% [d] | 44% [d] | 50-150% |
| | d3-MeFOSAA | 38% [d] | 53% | 50-150% |
| | 13C2-4:2FTS | 53% | 59% | 50-150% |
| | 13C2-6:2FTS | 57% | 62% | 50-150% |
| | 13C2-8:2FTS | 40% [d] | 58% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits, Confirmed by batch QC.
(d) Outside control limits due to matrix interference.



U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

# Misc. Forms

## Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA77769

**SGS North America Inc.**
**CHAIN OF CUSTODY RECORD**

Locations Nationwide
Alaska, Florida, New Jersey, Colorado, Texas, North Carolina, Virginia, Louisiana
www.us.sgs.com

CLIENT: SGS North America Inc. - Alaska Division | SGS Reference: **SGS Orlando, FL** | Page 1 of 1

CONTACT: Julie Shumway | PHONE NO: (907) 562-2343 | Additional Comments: All soils report out in dry weight unless

PROJECT NAME: 1204107 | PWSID#: | NPDL#:

REPORTS TO: Julie Shumway | E-MAIL: Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com

INVOICE TO: SGS - Alaska | QUOTE #: | P.O. #: 1204107

Preservative Used: NONE

| RESERVED for lab use | SAMPLE IDENTIFICATION | DATE mm/dd/yy | TIME HHMM | MATRIX/ MATRIX CODE | # CONTAINERS | TYPE C = COMP G = GRAB MI = Multi Incremental Soils | EPA 537 PFAS 24 | | | | MS | MSD | SGS lab # | Location ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | T2-01A | 08/11/2020 | 10:35:00 | SO | 1 | | X | | | | | | 1204107001 | |
| 2 | T2-01B | 08/11/2020 | 10:50:00 | SO | 1 | | X | | | | | | 1204107002 | |
| 3 | T2-03A | 08/11/2020 | 11:30:00 | SO | 1 | | X | | | | | | 1204107003 | |
| 4 | T2-X | 08/11/2020 | 10:40:00 | SO | 1 | | X | | | | | | 1204107004 | |

INITIAL ASSESSMENT BG
LABEL VERIFICATION JK

| Relinquished By | Date | Time | Received By |
|---|---|---|---|
| (1) J Shumway | 8/12/20 | 0929 | Fedex |
| (2) Fedex | 8/13/20 | 945 | [illegible signature] |
| (3) | | | |
| (4) | | | Received For Laboratory By: |

DOD Project? YES
Report to DL (J Flags)? YES
If J- Report as DL/LOD/LOQ.
Data Deliverable Requirements: QC2
Cooler ID:
Requested Turnaround Time and-or Special Instructions:
Temp Blank °C: 3.6 or Ambient [ ]
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411



FA77769: Chain of Custody
Page 1 of 2

# SGS Sample Receipt Summary

**Job Number:** FA77769 **Client:** SGS NORTH AMERICA, INC. - ALASKA DI **Project:** 1204107

**Date / Time Received:** 8/13/2020 9:45:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 148348008387

**Therm ID:** IR 1; **Therm CF:** -0.2; **# of Coolers:** 1

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.2);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.0);

| Cooler Information | Y | N |
|---|---|---|
| 1. Custody Seals Present | ✔ | ☐ |
| 2. Custody Seals Intact | ✔ | ☐ |
| 3. Temp criteria achieved | ✔ | ☐ |
| 4. Cooler temp verification | IR Gun | |
| 5. Cooler media | Ice (Bag) | |

| Trip Blank Information | Y | N | N/A |
|---|---|---|---|
| 1. Trip Blank present / cooler | ☐ | ☐ | ✔ |
| 2. Trip Blank listed on COC | ☐ | ☐ | ✔ |
| | **W** | **S** | **N/A** |
| 3. Type Of TB Received | ☐ | ☐ | ✔ |

| Sample Information | Y | N | N/A |
|---|---|---|---|
| 1. Sample labels present on bottles | ✔ | ☐ | |
| 2. Samples preserved properly | ✔ | ☐ | |
| 3. Sufficient volume/containers recvd for analysis: | ✔ | ☐ | |
| 4. Condition of sample | Intact | | |
| 5. Sample recvd within HT | ✔ | ☐ | |
| 6. Dates/Times/IDs on COC match Sample Label | ✔ | ☐ | |
| 7. VOCs have headspace | ☐ | ☐ | ✔ |
| 8. Bottles received for unspecified tests | ☐ | ✔ | |
| 9. Compositing instructions clear | ☐ | ☐ | ✔ |
| 10. Voa Soil Kits/Jars received past 48hrs? | ☐ | ☐ | ✔ |
| 11. % Solids Jar received? | ☐ | ☐ | ✔ |
| 12. Residual Chlorine Present? | ☐ | ☐ | ✔ |

**Misc. Information**

Number of Encores: 25-Gram ______ 5-Gram ______ Number of 5035 Field Kits: ______ Number of Lab Filtered Metals: ______

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) ______ ______

Residual Chlorine Test Strip Lot #: ______

Comments

SM001
Rev. Date 05/24/17

Technician: BRYANG Date: 8/13/2020 9:45:00 AM Reviewer: ______ Date: ______



FA77769: Chain of Custody
Page 2 of 2

# QC Evaluation: DOD QSM5.x Limits



**Job Number:** FA77769
**Account:** SGS North America, Inc
**Project:** 1204107
**Collected:** 08/11/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81627 | EPA 537M QSM5.3 B-15 | | | | | | |
| OP81627-BS | 375-22-4 | Perfluorobutanoic acid | BSP | REC | 93 | % | 71-135 |
| OP81627-BS | 2706-90-3 | Perfluoropentanoic acid | BSP | REC | 86 | % | 69-132 |
| OP81627-BS | 307-24-4 | Perfluorohexanoic acid | BSP | REC | 87 | % | 70-132 |
| OP81627-BS | 375-85-9 | Perfluoroheptanoic acid | BSP | REC | 89 | % | 71-131 |
| OP81627-BS | 335-67-1 | Perfluorooctanoic acid | BSP | REC | 93 | % | 69-133 |
| OP81627-BS | 375-95-1 | Perfluorononanoic acid | BSP | REC | 87 | % | 72-129 |
| OP81627-BS | 335-76-2 | Perfluorodecanoic acid | BSP | REC | 88 | % | 69-133 |
| OP81627-BS | 2058-94-8 | Perfluoroundecanoic acid | BSP | REC | 88 | % | 64-136 |
| OP81627-BS | 307-55-1 | Perfluorododecanoic acid | BSP | REC | 88 | % | 69-135 |
| OP81627-BS | 72629-94-8 | Perfluorotridecanoic acid | BSP | REC | 88 | % | 66-139 |
| OP81627-BS | 376-06-7 | Perfluorotetradecanoic acid | BSP | REC | 85 | % | 69-133 |
| OP81627-BS | 375-73-5 | Perfluorobutanesulfonic acid | BSP | REC | 91 | % | 72-128 |
| OP81627-BS | 2706-91-4 | Perfluoropentanesulfonic acid | BSP | REC | 81 | % | 73-123 |
| OP81627-BS | 355-46-4 | Perfluorohexanesulfonic acid | BSP | REC | 85 | % | 67-130 |
| OP81627-BS | 375-92-8 | Perfluoroheptanesulfonic acid | BSP | REC | 93 | % | 70-132 |
| OP81627-BS | 1763-23-1 | Perfluorooctanesulfonic acid | BSP | REC | 85 | % | 67-136 |
| OP81627-BS | 68259-12-1 | Perfluorononanesulfonic acid | BSP | REC | 87 | % | 69-125 |
| OP81627-BS | 335-77-3 | Perfluorodecanesulfonic acid | BSP | REC | 87 | % | 59-134 |
| OP81627-BS | 754-91-6 | PFOSA | BSP | REC | 86 | % | 67-137 |
| OP81627-BS | 2355-31-9 | MeFOSAA | BSP | REC | 94 | % | 63-144 |
| OP81627-BS | 2991-50-6 | EtFOSAA | BSP | REC | 86 | % | 61-139 |
| OP81627-BS | 757124-72-4 | 4:2 Fluorotelomer sulfonate | BSP | REC | 95 | % | 62-145 |
| OP81627-BS | 27619-97-2 | 6:2 Fluorotelomer sulfonate | BSP | REC | 96 | % | 64-140 |
| OP81627-BS | 39108-34-4 | 8:2 Fluorotelomer sulfonate | BSP | REC | 97 | % | 65-137 |
| OP81627-MS | 375-22-4 | Perfluorobutanoic acid | MS | REC | 100 | % | 71-135 |
| OP81627-MS | 2706-90-3 | Perfluoropentanoic acid | MS | REC | 94 | % | 69-132 |
| OP81627-MS | 307-24-4 | Perfluorohexanoic acid | MS | REC | 92 | % | 70-132 |
| OP81627-MS | 375-85-9 | Perfluoroheptanoic acid | MS | REC | 98 | % | 71-131 |
| OP81627-MS | 335-67-1 | Perfluorooctanoic acid | MS | REC | 103 | % | 69-133 |
| OP81627-MS | 375-95-1 | Perfluorononanoic acid | MS | REC | 91 | % | 72-129 |
| OP81627-MS | 335-76-2 | Perfluorodecanoic acid | MS | REC | 91 | % | 69-133 |
| OP81627-MS | 2058-94-8 | Perfluoroundecanoic acid | MS | REC | 94 | % | 64-136 |
| OP81627-MS | 307-55-1 | Perfluorododecanoic acid | MS | REC | 96 | % | 69-135 |
| OP81627-MS | 72629-94-8 | Perfluorotridecanoic acid | MS | REC | 86 | % | 66-139 |
| OP81627-MS | 376-06-7 | Perfluorotetradecanoic acid | MS | REC | 92 | % | 69-133 |
| OP81627-MS | 375-73-5 | Perfluorobutanesulfonic acid | MS | REC | 100 | % | 72-128 |
| OP81627-MS | 2706-91-4 | Perfluoropentanesulfonic acid | MS | REC | 87 | % | 73-123 |
| OP81627-MS | 355-46-4 | Perfluorohexanesulfonic acid | MS | REC | 98 | % | 67-130 |
| OP81627-MS | 375-92-8 | Perfluoroheptanesulfonic acid | MS | REC | 107 | % | 70-132 |
| OP81627-MS | 1763-23-1 | Perfluorooctanesulfonic acid | MS | REC | 62 [a] | % | 67-136 |
| OP81627-MS | 68259-12-1 | Perfluorononanesulfonic acid | MS | REC | 77 | % | 69-125 |
| OP81627-MS | 335-77-3 | Perfluorodecanesulfonic acid | MS | REC | 119 | % | 59-134 |

* Sample used for QC is not from job FA77769

# QC Evaluation: DOD QSM5.x Limits

**Job Number:** FA77769
**Account:** SGS North America, Inc
**Project:** 1204107
**Collected:** 08/11/20

| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81627-MS | 754-91-6 | PFOSA | MS | REC | 96 | % | 67-137 |
| OP81627-MS | 2355-31-9 | MeFOSAA | MS | REC | 98 | % | 63-144 |
| OP81627-MS | 2991-50-6 | EtFOSAA | MS | REC | 97 | % | 61-139 |
| OP81627-MS | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MS | REC | 103 | % | 62-145 |
| OP81627-MS | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MS | REC | 105 | % | 64-140 |
| OP81627-MS | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MS | REC | 100 | % | 65-137 |
| OP81627-MSD | 375-22-4 | Perfluorobutanoic acid | MSD | REC | 99 | % | 71-135 |
| OP81627-MSD | 375-22-4 | Perfluorobutanoic acid | MSD | RPD | 5 | % | 30 |
| OP81627-MSD | 2706-90-3 | Perfluoropentanoic acid | MSD | REC | 93 | % | 69-132 |
| OP81627-MSD | 2706-90-3 | Perfluoropentanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 307-24-4 | Perfluorohexanoic acid | MSD | REC | 91 | % | 70-132 |
| OP81627-MSD | 307-24-4 | Perfluorohexanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 375-85-9 | Perfluoroheptanoic acid | MSD | REC | 96 | % | 71-131 |
| OP81627-MSD | 375-85-9 | Perfluoroheptanoic acid | MSD | RPD | 5 | % | 30 |
| OP81627-MSD | 335-67-1 | Perfluorooctanoic acid | MSD | REC | 103 | % | 69-133 |
| OP81627-MSD | 335-67-1 | Perfluorooctanoic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD | 375-95-1 | Perfluorononanoic acid | MSD | REC | 91 | % | 72-129 |
| OP81627-MSD | 375-95-1 | Perfluorononanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 335-76-2 | Perfluorodecanoic acid | MSD | REC | 88 | % | 69-133 |
| OP81627-MSD | 335-76-2 | Perfluorodecanoic acid | MSD | RPD | 8 | % | 30 |
| OP81627-MSD | 2058-94-8 | Perfluoroundecanoic acid | MSD | REC | 93 | % | 64-136 |
| OP81627-MSD | 2058-94-8 | Perfluoroundecanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 307-55-1 | Perfluorododecanoic acid | MSD | REC | 95 | % | 69-135 |
| OP81627-MSD | 307-55-1 | Perfluorododecanoic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 72629-94-8 | Perfluorotridecanoic acid | MSD | REC | 92 | % | 66-139 |
| OP81627-MSD | 72629-94-8 | Perfluorotridecanoic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD | 376-06-7 | Perfluorotetradecanoic acid | MSD | REC | 92 | % | 69-133 |
| OP81627-MSD | 376-06-7 | Perfluorotetradecanoic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD | 375-73-5 | Perfluorobutanesulfonic acid | MSD | REC | 100 | % | 72-128 |
| OP81627-MSD | 375-73-5 | Perfluorobutanesulfonic acid | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | REC | 86 | % | 73-123 |
| OP81627-MSD | 2706-91-4 | Perfluoropentanesulfonic acid | MSD | RPD | 5 | % | 30 |
| OP81627-MSD | 355-46-4 | Perfluorohexanesulfonic acid | MSD | REC | 103 | % | 67-130 |
| OP81627-MSD | 355-46-4 | Perfluorohexanesulfonic acid | MSD | RPD | 2 | % | 30 |
| OP81627-MSD | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | REC | 107 | % | 70-132 |
| OP81627-MSD | 375-92-8 | Perfluoroheptanesulfonic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | REC | 139 [a] | % | 67-136 |
| OP81627-MSD | 1763-23-1 | Perfluorooctanesulfonic acid | MSD | RPD | 23 | % | 30 |
| OP81627-MSD | 68259-12-1 | Perfluorononanesulfonic acid | MSD | REC | 72 | % | 69-125 |
| OP81627-MSD | 68259-12-1 | Perfluorononanesulfonic acid | MSD | RPD | 9 | % | 30 |
| OP81627-MSD | 335-77-3 | Perfluorodecanesulfonic acid | MSD | REC | 120 | % | 59-134 |
| OP81627-MSD | 335-77-3 | Perfluorodecanesulfonic acid | MSD | RPD | 3 | % | 30 |
| OP81627-MSD | 754-91-6 | PFOSA | MSD | REC | 91 | % | 67-137 |
| OP81627-MSD | 754-91-6 | PFOSA | MSD | RPD | 9 | % | 30 |
| OP81627-MSD | 2355-31-9 | MeFOSAA | MSD | REC | 100 | % | 63-144 |

* Sample used for QC is not from job FA77769

# QC Evaluation: DOD QSM5.x Limits



**Job Number:** FA77769
**Account:** SGS North America, Inc
**Project:** 1204107
**Collected:** 08/11/20



| QC Sample ID | CAS# | Analyte | Sample Type | Result Type | Result | Units | Limits |
|---|---|---|---|---|---|---|---|
| OP81627-MSD | 2355-31-9 | MeFOSAA | MSD | RPD | 1 | % | 30 |
| OP81627-MSD | 2991-50-6 | EtFOSAA | MSD | REC | 96 | % | 61-139 |
| OP81627-MSD | 2991-50-6 | EtFOSAA | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | REC | 102 | % | 62-145 |
| OP81627-MSD | 757124-72-4 | 4:2 Fluorotelomer sulfonate | MSD | RPD | 4 | % | 30 |
| OP81627-MSD | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | REC | 102 | % | 64-140 |
| OP81627-MSD | 27619-97-2 | 6:2 Fluorotelomer sulfonate | MSD | RPD | 6 | % | 30 |
| OP81627-MSD | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | REC | 101 | % | 65-137 |
| OP81627-MSD | 39108-34-4 | 8:2 Fluorotelomer sulfonate | MSD | RPD | 3 | % | 30 |

(a) Outside control limits due to high level in sample relative to spike amount.



* Sample used for QC is not from job FA77769

# MS Semi-volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Instrument Blank



**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q70-IBLK | 4Q5022.D | 1 | 08/20/20 | NAF | n/a | n/a | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 104% | 50-150% |
| | 13C5-PFPeA | 104% | 50-150% |
| | 13C5-PFHxA | 105% | 50-150% |
| | 13C4-PFHpA | 105% | 50-150% |
| | 13C8-PFOA | 109% | 50-150% |
| | 13C9-PFNA | 107% | 50-150% |
| | 13C6-PFDA | 108% | 50-150% |
| | 13C7-PFUnDA | 106% | 50-150% |
| | 13C2-PFDoDA | 106% | 50-150% |
| | 13C2-PFTeDA | 106% | 50-150% |
| | 13C3-PFBS | 107% | 50-150% |
| | 13C3-PFHxS | 103% | 50-150% |
| | 13C8-PFOS | 103% | 50-150% |
| | 13C8-FOSA | 113% | 50-150% |
| | d3-MeFOSAA | 105% | 50-150% |
| | 13C2-4:2FTS | 94% | 50-150% |
| | 13C2-6:2FTS | 98% | 50-150% |
| | 13C2-8:2FTS | 95% | 50-150% |

# Instrument Blank

**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q71-IBLK | 4Q5092.D | 1 | 08/21/20 | NG | n/a | n/a | S4Q71 |





**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 99% | 50-150% |
| | 13C5-PFPeA | 100% | 50-150% |
| | 13C5-PFHxA | 102% | 50-150% |
| | 13C4-PFHpA | 102% | 50-150% |
| | 13C8-PFOA | 107% | 50-150% |
| | 13C9-PFNA | 104% | 50-150% |
| | 13C6-PFDA | 108% | 50-150% |
| | 13C7-PFUnDA | 106% | 50-150% |
| | 13C2-PFDoDA | 107% | 50-150% |
| | 13C2-PFTeDA | 108% | 50-150% |
| | 13C3-PFBS | 105% | 50-150% |
| | 13C3-PFHxS | 103% | 50-150% |
| | 13C8-PFOS | 103% | 50-150% |
| | 13C8-FOSA | 107% | 50-150% |

# Instrument Blank



**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| S4Q71-IBLK | 4Q5092.D | 1 | 08/21/20 | NG | n/a | n/a | S4Q71 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | d3-MeFOSAA | 108% | 50-150% |
| | 13C2-4:2FTS | 92% | 50-150% |
| | 13C2-6:2FTS | 96% | 50-150% |
| | 13C2-8:2FTS | 95% | 50-150% |

# Method Blank Summary



**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MB | 4Q5067.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 0.38 | 1.0 | 0.25 | ug/kg | J |
| 2706-90-3 | Perfluoropentanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 307-24-4 | Perfluorohexanoic acid | ND | 1.0 | 0.20 | ug/kg | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-67-1 | Perfluorooctanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-95-1 | Perfluorononanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-76-2 | Perfluorodecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 307-55-1 | Perfluorododecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 1.0 | 0.25 | ug/kg | |
| 754-91-6 | PFOSA | ND | 1.0 | 0.25 | ug/kg | |
| 2355-31-9 | MeFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 2991-50-6 | EtFOSAA | ND | 2.5 | 0.50 | ug/kg | |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 1.0 | 0.25 | ug/kg | |

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C4-PFBA | 85% | 50-150% |
| | 13C5-PFPeA | 90% | 50-150% |
| | 13C5-PFHxA | 93% | 50-150% |
| | 13C4-PFHpA | 93% | 50-150% |
| | 13C8-PFOA | 100% | 50-150% |
| | 13C9-PFNA | 96% | 50-150% |
| | 13C6-PFDA | 97% | 50-150% |
| | 13C7-PFUnDA | 93% | 50-150% |

# Method Blank Summary

**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MB | 4Q5067.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | ID Standard Recoveries | | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 93% | 50-150% |
| | 13C2-PFTeDA | 89% | 50-150% |
| | 13C3-PFBS | 97% | 50-150% |
| | 13C3-PFHxS | 97% | 50-150% |
| | 13C8-PFOS | 94% | 50-150% |
| | 13C8-FOSA | 93% | 50-150% |
| | d3-MeFOSAA | 98% | 50-150% |
| | 13C2-4:2FTS | 86% | 50-150% |
| | 13C2-6:2FTS | 91% | 50-150% |
| | 13C2-8:2FTS | 87% | 50-150% |

# Blank Spike Summary

**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-BS | 4Q5066.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 10 | 9.3 | 93 | 71-135 |
| 2706-90-3 | Perfluoropentanoic acid | 10 | 8.6 | 86 | 69-132 |
| 307-24-4 | Perfluorohexanoic acid | 10 | 8.7 | 87 | 70-132 |
| 375-85-9 | Perfluoroheptanoic acid | 10 | 8.9 | 89 | 71-131 |
| 335-67-1 | Perfluorooctanoic acid | 10 | 9.3 | 93 | 69-133 |
| 375-95-1 | Perfluorononanoic acid | 10 | 8.7 | 87 | 72-129 |
| 335-76-2 | Perfluorodecanoic acid | 10 | 8.8 | 88 | 69-133 |
| 2058-94-8 | Perfluoroundecanoic acid | 10 | 8.8 | 88 | 64-136 |
| 307-55-1 | Perfluorododecanoic acid | 10 | 8.8 | 88 | 69-135 |
| 72629-94-8 | Perfluorotridecanoic acid | 10 | 8.8 | 88 | 66-139 |
| 376-06-7 | Perfluorotetradecanoic acid | 10 | 8.5 | 85 | 69-133 |
| 375-73-5 | Perfluorobutanesulfonic acid | 10 | 9.1 | 91 | 72-128 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 10 | 8.1 | 81 | 73-123 |
| 355-46-4 | Perfluorohexanesulfonic acid | 10 | 8.5 | 85 | 67-130 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 10 | 9.3 | 93 | 70-132 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 10 | 8.5 | 85 | 67-136 |
| 68259-12-1 | Perfluorononanesulfonic acid | 10 | 8.7 | 87 | 69-125 |
| 335-77-3 | Perfluorodecanesulfonic acid | 10 | 8.7 | 87 | 59-134 |
| 754-91-6 | PFOSA | 10 | 8.6 | 86 | 67-137 |
| 2355-31-9 | MeFOSAA | 10 | 9.4 | 94 | 63-144 |
| 2991-50-6 | EtFOSAA | 10 | 8.6 | 86 | 61-139 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 10 | 9.5 | 95 | 62-145 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 10 | 9.6 | 96 | 64-140 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 10 | 9.7 | 97 | 65-137 |

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C4-PFBA | 90% | 50-150% |
| | 13C5-PFPeA | 95% | 50-150% |
| | 13C5-PFHxA | 98% | 50-150% |
| | 13C4-PFHpA | 97% | 50-150% |
| | 13C8-PFOA | 103% | 50-150% |
| | 13C9-PFNA | 99% | 50-150% |
| | 13C6-PFDA | 101% | 50-150% |
| | 13C7-PFUnDA | 97% | 50-150% |

* = Outside of Control Limits.

# Blank Spike Summary



**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-BS | 4Q5066.D | 1 | 08/20/20 | NAF | 08/19/20 | OP81627 | S4Q70 |



**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---|---|---|---|
| | 13C2-PFDoDA | 96% | 50-150% |
| | 13C2-PFTeDA | 95% | 50-150% |
| | 13C3-PFBS | 97% | 50-150% |
| | 13C3-PFHxS | 102% | 50-150% |
| | 13C8-PFOS | 100% | 50-150% |
| | 13C8-FOSA | 94% | 50-150% |
| | d3-MeFOSAA | 103% | 50-150% |
| | 13C2-4:2FTS | 95% | 50-150% |
| | 13C2-6:2FTS | 99% | 50-150% |
| | 13C2-8:2FTS | 96% | 50-150% |



* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MS | 4Q5133.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| OP81627-MSD | 4Q5134.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 | 4Q5132.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 [a] | 4Q5083.D | 10 | 08/21/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | Compound | FA77769-4 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | Spike ug/kg | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 375-22-4 | Perfluorobutanoic acid | 3.5 U | | 36.1 | 36.0 | 100 | 34.9 | 34.4 | 99 | 5 | 71-135/30 |
| 2706-90-3 | Perfluoropentanoic acid | 1.4 | J | 36.1 | 35.3 | 94 | 34.9 | 33.8 | 93 | 4 | 69-132/30 |
| 307-24-4 | Perfluorohexanoic acid | 2.2 | J | 36.1 | 35.5 | 92 | 34.9 | 34.0 | 91 | 4 | 70-132/30 |
| 375-85-9 | Perfluoroheptanoic acid | 1.5 | J | 36.1 | 36.7 | 98 | 34.9 | 34.8 | 96 | 5 | 71-131/30 |
| 335-67-1 | Perfluorooctanoic acid | 1.7 | J | 36.1 | 38.9 | 103 | 34.9 | 37.7 | 103 | 3 | 69-133/30 |
| 375-95-1 | Perfluorononanoic acid | 1.2 | J | 36.1 | 34.2 | 91 | 34.9 | 33.0 | 91 | 4 | 72-129/30 |
| 335-76-2 | Perfluorodecanoic acid | 35 U [b] | | 36.1 | 33.0 | 91 | 34.9 | 30.6 | 88 | 8 | 69-133/30 |
| 2058-94-8 | Perfluoroundecanoic acid | 35 U [b] | | 36.1 | 34.0 | 94 | 34.9 | 32.6 | 93 | 4 | 64-136/30 |
| 307-55-1 | Perfluorododecanoic acid | 35 U [b] | | 36.1 | 34.5 | 96 | 34.9 | 33.0 | 95 | 4 | 69-135/30 |
| 72629-94-8 | Perfluorotridecanoic acid | 35 U [b] | | 36.1 | 31.1 | 86 | 34.9 | 32.2 | 92 | 3 | 66-139/30 |
| 376-06-7 | Perfluorotetradecanoic acid | 35 U [b] | | 36.1 | 33.1 | 92 | 34.9 | 32.1 | 92 | 3 | 69-133/30 |
| 375-73-5 | Perfluorobutanesulfonic acid | 3.5 U | | 36.1 | 36.1 | 100 | 34.9 | 34.7 | 100 | 4 | 72-128/30 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 3.5 U | | 36.1 | 31.3 | 87 | 34.9 | 29.9 | 86 | 5 | 73-123/30 |
| 355-46-4 | Perfluorohexanesulfonic acid | 6.9 | | 36.1 | 42.2 | 98 | 34.9 | 42.9 | 103 | 2 | 67-130/30 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 3.5 U | | 36.1 | 38.5 | 107 | 34.9 | 37.4 | 107 | 3 | 70-132/30 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 77.7 | | 36.1 | 100 | 62* [c] | 34.9 | 126 | 139* [c] | 23 | 67-136/30 |
| 68259-12-1 | Perfluorononanesulfonic acid | 3.5 U | | 36.1 | 27.7 | 77 | 34.9 | 25.2 | 72 | 9 | 69-125/30 |
| 335-77-3 | Perfluorodecanesulfonic acid | 3.5 U | | 36.1 | 43.1 | 119 | 34.9 | 41.7 | 120 | 3 | 59-134/30 |
| 754-91-6 | PFOSA | 35 U [b] | | 36.1 | 34.7 | 96 | 34.9 | 31.6 | 91 | 9 | 67-137/30 |
| 2355-31-9 | MeFOSAA | 87 U [b] | | 36.1 | 35.2 | 98 | 34.9 | 34.8 | 100 | 1 | 63-144/30 |
| 2991-50-6 | EtFOSAA | 87 U [b] | | 36.1 | 34.9 | 97 | 34.9 | 33.6 | 96 | 4 | 61-139/30 |
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | 3.5 U | | 36.1 | 37.1 | 103 | 34.9 | 35.5 | 102 | 4 | 62-145/30 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 3.5 U | | 36.1 | 37.7 | 105 | 34.9 | 35.4 | 102 | 6 | 64-140/30 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 35 U [b] | | 36.1 | 36.2 | 100 | 34.9 | 35.1 | 101 | 3 | 65-137/30 |

| CAS No. | ID Standard Recoveries | MS | MSD | FA77769-4 | FA77769-4 | Limits |
|---|---|---|---|---|---|---|
| | 13C4-PFBA | 65% | 67% | 61% | 61% | 50-150% |
| | 13C5-PFPeA | 50% | 52% | 50% | 59% | 50-150% |
| | 13C5-PFHxA | 51% | 53% | 51% | 62% | 50-150% |
| | 13C4-PFHpA | 52% | 53% | 51% | 62% | 50-150% |
| | 13C8-PFOA | 55% | 56% | 55% | 65% | 50-150% |
| | 13C9-PFNA | 53% | 53% | 51% | 62% | 50-150% |
| | 13C6-PFDA | 47%* [d] | 45%* [d] | 41%* [d] | 62% | 50-150% |
| | 13C7-PFUnDA | 49%* [d] | 46%* [d] | 44%* [d] | 55% | 50-150% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** FA77769
**Account:** SGSAKA SGS North America, Inc
**Project:** 1204107

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP81627-MS | 4Q5133.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| OP81627-MSD | 4Q5134.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 | 4Q5132.D | 1 | 08/21/20 | NG | 08/19/20 | OP81627 | S4Q71 |
| FA77769-4 [a] | 4Q5083.D | 10 | 08/21/20 | NAF | 08/19/20 | OP81627 | S4Q70 |

**The QC reported here applies to the following samples:** **Method:** EPA 537M QSM5.3 B-15

FA77769-1, FA77769-2, FA77769-3, FA77769-4

| CAS No. | ID Standard Recoveries | MS | MSD | FA77769-4 | FA77769-4 | Limits |
|---|---|---|---|---|---|---|
| | 13C2-PFDoDA | 44%* [d] | 40%* [d] | 34%* [d] | 52% | 50-150% |
| | 13C2-PFTeDA | 40%* [d] | 32%* [d] | 25%* [d] | 50% | 50-150% |
| | 13C3-PFBS | 56% | 58% | 56% | 63% | 50-150% |
| | 13C3-PFHxS | 62% | 62% | 59% | 67% | 50-150% |
| | 13C8-PFOS | 63% | 65% | 61% | 61% | 50-150% |
| | 13C8-FOSA | 17%* [d] | 19%* [d] | 15%* [d] | 44%* [d] | 50-150% |
| | d3-MeFOSAA | 41%* [d] | 41%* [d] | 38%* [d] | 53% | 50-150% |
| | 13C2-4:2FTS | 56% | 58% | 53% | 59% | 50-150% |
| | 13C2-6:2FTS | 62% | 63% | 57% | 62% | 50-150% |
| | 13C2-8:2FTS | 47%* [d] | 45%* [d] | 40%* [d] | 58% | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run #2.
(c) Outside control limits due to high level in sample relative to spike amount.
(d) Outside control limits due to matrix interference.



* = Outside of Control Limits.

# Appendix F – ADEC Laboratory Data Review Checklists

# Laboratory Data Review Checklist

Completed By:

Lucus Gamble, QEP

Title:

Environmental Sciences Manager

Date:

September 15, 2020

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1204021

Laboratory Report Date:

September 9, 2020

CS Site Name:

TBD

ADEC File Number:

TBD

Hazard Identification Number:

TBD

1204021

Laboratory Report Date:

September 9, 2020

CS Site Name:

TBD

**Note: Any N/A or No box checked must have an explanation in the comments box.**

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   SGS North America Inc.

   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☐ N/A☐ Comments:

   PFAS samples were transferred to SGS Orlando

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   A copy of the CoC is provided with the lab report

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   PFAS by EPA 537M, GRO by AK 101, DRO by AK 102, RRO by AK 103, BTEX by EPA 8021B, TOC by EPA 9060A

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☐ No☒ N/A☐ Comments:

   Temperature Blank = 11.4° C, but submitted to directly to the lab after sampling on August 8, 2020

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☒ Comments:

   GRO/BTEX was preserved using methanol

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c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

See page 50 of the lab report. Samples were 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☐ N/A☐ Comments:

The cooler temperature was outside of the acceptable range – see note above

e. Data quality or usability affected?

Comments:

Data quality or usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

Case narratives are found on Page 2 and Pages 57-62 of the lab report

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Some PFAS soils samples were subject to target and non-target analyte matrix interference and re-extraction and reanalysis was required

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Corrective actions are documented in the case narrative and following the effected samples

d. What is the effect on data quality/usability according to the case narrative?

Comments:

In many cases the Limit of Detection (LOD) is above the ADEC cleanup level

| |
|---|
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|---|
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5. Samples Results

   a. Correct analyses performed/reported as requested on COC?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Full list of PFAS compounds by EPA 537M, GRO by AK 101, DRO by AK 102, DRO by AK 103, BTEX by EPA 8021B and TOC by EPA 9060A |

   b. All applicable holding times met?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| All holding times were met |

   c. All soils reported on a dry weight basis?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Soil samples are reported on a dry weight basis. The % solids are shown in the lab report |

   d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

      Yes☐ No☒ N/A☐ Comments:

| |
|---|
| Often LOQs for PFOA and PFOS are above ADEC Method 2 MTG cleanup levels. However, in all instances the LOQs are below the ADEC Human Health cleanup levels. Samples with LODs (1/2 the LOQ) above ADEC cleanup levels are highlighted blue in the results tables. Further the LOQ for benzene and ethylbenzene is above ADEC Method 2 MTG cleanup levels |

   e. Data quality or usability affected?

| |
|---|
| Data quality or usability not affected as PFAS impacts are ubiquitous at the site and many of the “detectable” samples are above ADEC Method 2 MTG cleanup levels. However, benzene and ethylbenzene cannot be compared to ADEC Method 2 MTG cleanup levels |

6. QC Samples

   a. Method Blank

      i. One method blank reported per matrix, analysis and 20 samples?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Method blank results are shown in the lab report |

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ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

The PFAS method blank had detectable concentrations of Perfluorobutanoic Acid

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

All samples analyzed for Perfluorobutanoic Acid samples in the lab report are affected. However, Perfluorobutanoic Acid is not a regulated PFAS compound

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☐ Comments:

The affected samples are not flagged. However, affected samples are shown on the Method Blank summary page of the lab report

v. Data quality or usability affected?

Comments:

Data quality and usability 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☐ N/A☐ Comments:

Note. SGS Orlando refers to these samples as Instrument Blanks

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No project soil metals or inorganics samples

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

All %R are within method and lab limits for this project

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Laboratory Report Date:

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TBD

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

The RPD for the LCS/LCSD samples are within method and lab limits

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No affected samples

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No affected samples

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

**Note: Leave blank if not required for project**

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

Results are shown in the lab report

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No project soil metals or organics samples

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

%R is outside control limits for numerous PFAS compounds because of matrix interference

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iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

All RPDs are within the method or lab limits despite poor %R

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

FA77715 (lab id) or T1-37B – affected project samples are shown on Pages 114-115 in the lab report

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

Yes. Data flags indicate the %R outside control limits and RPD impacted by matrix interference

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☐ N/A☒ Comments:

No IDA

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No IDA

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No IDA

| |
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| TBD |

iv. Data quality or usability affected?

Comments:

| |
|---|
| N/A as there was no IDA |

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☒ N/A☐ Comments:

| |
|---|
| Trip blank results are shown on Page 30 of the lab report |

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☐ N/A☐ Comments:

| |
|---|
| The cooler ID is shown on the CoC |

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☒ Comments:

| |
|---|
| All LOQs are less than the ADEC Method 2 MTG cleanup levels for GRO/BTEX |

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

| |
|---|
| No affected samples |

v. Data quality or usability affected?

Comments:

| |
|---|
| Data quality or usability not affected |

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| T1-X is a blind duplicate of T1-19A (for PFAS samples) and T1-Y is a blind duplicate of T1-19A (for GRO |

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CS Site Name:

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ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

All field duplicates were submitted blind to the lab

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where $R_1$ = Sample Concentration
$R_2$ = Field Duplicate Concentration

Yes☒ No☒ N/A☐ Comments:

T1-X/T1-19A PFOA RPD = 77.42 and PFOS RPD = 97.79%; T1-Y/T1-19A DRO RPD = 1.17% and RRO RPD = 5.20%

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality and usability not affected as RSE used the higher of the two results in the UCL calculator and other discussions

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☒ No☒ N/A☐ Comments:

No decon or equipment blank samples for this project

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decon or equipment blank samples for this project

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No affected samples

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

| |
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7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Data flags indicate the re-extraction, reanalysis and which run data was used in the lab report, as well as which samples are impacted by matrix interference |

# Laboratory Data Review Checklist

Completed By:

Lucus Gamble, QEP

Title:

Environmental Sciences Manager

Date:

September 15, 2020

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1204046

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

ADEC File Number:

TBD

Hazard Identification Number:

TBD

1204046

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

**Note: Any N/A or No box checked must have an explanation in the comments box.**

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   SGS North America Inc.

   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☐ N/A☐ Comments:

   PFAS samples were transferred to SGS Orlando

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   A copy of the CoC is provided with the lab report

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   PFAS by EPA 537M, GRO by AK 101, DRO by AK 102, RRO by AK 103, BTEX by EPA 8021B, TOC by EPA 9060A

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature Blank = 4.6° C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☒ Comments:

   GRO/BTEX was preserved using methanol

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Laboratory Report Date:

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CS Site Name:

TBD

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

See page 45 of the lab report. Samples were 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☒ N/A☐ Comments:

There are no discrepancies noted

e. Data quality or usability affected?

Comments:

Data quality or usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

Case narratives are found on Page 2 and Pages 51-55 of the lab report

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Some PFAS soils samples were subject to target and non-target analyte matrix interference and re-extraction and reanalysis was required

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Corrective actions are documented in the case narrative and following the effected samples

d. What is the effect on data quality/usability according to the case narrative?

Comments:

In many cases the Limit of Detection (LOD) is above the ADEC cleanup level

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

5. Samples Results

   a. Correct analyses performed/reported as requested on COC?

      Yes☒ No☐ N/A☐ Comments:

      Full list of PFAS compounds by EPA 537M, GRO by AK 101, DRO by AK 102, DRO by AK 103, BTEX by EPA 8021B and TOC by EPA 9060A

   b. All applicable holding times met?

      Yes☒ No☐ N/A☐ Comments:

      All holding times were met

   c. All soils reported on a dry weight basis?

      Yes☒ No☐ N/A☐ Comments:

      Soil samples are reported on a dry weight basis. The % solids are shown in the lab report

   d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

      Yes☐ No☒ N/A☐ Comments:

      Often LOQs for PFOA and PFOS are above ADEC Method 2 MTG cleanup levels. However, in all instances the LOQs are below the ADEC Human Health cleanup levels. Samples with LODs (1/2 the LOQ) above ADEC cleanup levels are highlighted blue in the results tables. Further the LOQs for benzene and ethylbenzene are above ADEC Method 2 MTG cleanup levels

   e. Data quality or usability affected?

      Data quality or usability not affected as PFAS impacts are ubiquitous at the site and many of the "detectable" samples are above ADEC Method 2 MTG cleanup levels. However, benzene and ethylbenzene cannot be compared to ADEC Method 2 MTG cleanup levels

6. QC Samples

   a. Method Blank

      i. One method blank reported per matrix, analysis and 20 samples?

      Yes☒ No☐ N/A☐ Comments:

      Method blank results are shown in the lab report

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|---|

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☒ N/A☐ Comments:

| All method blank results are less the LOQs |
|---|

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

| There are no affected samples |
|---|

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☒ Comments:

| There are no affected samples |
|---|

v. Data quality or usability affected?

Comments:

| Data quality and usability 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☐ N/A☐ Comments:

| Note. SGS Orlando refers to these samples as Instrument Blanks |
|---|

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

| No project soil metals or inorganics samples |
|---|

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

| All %R are within method and lab limits for this project |
|---|

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

The RPD for the LCS/LCSD samples are within method and lab limits

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No affected samples

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No affected samples

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

**Note: Leave blank if not required for project**

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

Results are shown in the lab report

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No project soil metals or organics samples

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☒ No☐ N/A☐ Comments:

All %R are within method and lab limits for this project

1204046

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

The RPD for the MS/MSD samples are within method and lab limits

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No affected samples

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No affected samples

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☐ N/A☒ Comments:

No IDA

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No IDA

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No IDA

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CS Site Name:

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iv. Data quality or usability affected?

Comments:

| |
|---|
| N/A as there was no IDA |

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☒ N/A☐ Comments:

| |
|---|
| Trip blank results are shown on Page 30 of the lab report |

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☐ N/A☐ Comments:

| |
|---|
| The cooler ID is shown on the CoC |

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☒ Comments:

| |
|---|
| All LOQs are less than the ADEC Method 2 MTG cleanup levels for GRO/BTEX |

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

| |
|---|
| No affected samples |

v. Data quality or usability affected?

Comments:

| |
|---|
| Data quality or usability not affected |

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| T1-XX is a blind duplicate of T1-11A (for PFAS samples) |

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Laboratory Report Date:

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CS Site Name:

TBD

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

All field duplicates were submitted blind to the lab

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where $R_1$ = Sample Concentration
$R_2$ = Field Duplicate Concentration

Yes☐ No☒ N/A☐ Comments:

T1-XX/T1-11A PFOS RPD = 64.92%

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality and usability not affected as RSE used the higher of the two results in the UCL calculator and other discussions

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☒ N/A☐ Comments:

No decon or equipment blank samples for this project

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decon or equipment blank samples for this project

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No affected samples

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

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September 3, 2020

CS Site Name:

TBD

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

      Data flags indicate the re-extraction, reanalysis and which run data was used in the lab report, as well as which samples are impacted by matrix interference

# Laboratory Data Review Checklist

Completed By:

Lucus Gamble, QEP

Title:

Environmental Sciences Manager

Date:

September 15, 2020

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1204074

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

ADEC File Number:

TBD

Hazard Identification Number:

TBD

1204074

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

**Note: Any N/A or No box checked must have an explanation in the comments box.**

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   SGS North America Inc.

   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☐ N/A☐ Comments:

   PFAS samples were transferred to SGS Orlando

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   A copy of the CoC is provided with the lab report

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   PFAS by EPA 537M, GRO by AK 101, DRO by AK 102, RRO by AK 103, BTEX by EPA 8021B, TOC by EPA 9060A

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature Blank = 4.7° C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☒ Comments:

   GRO/BTEX was preserved using methanol

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

See page 40 of the lab report. Samples were 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☒ N/A☐ Comments:

There are no discrepancies noted

e. Data quality or usability affected?

Comments:

Data quality or usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

Case narratives are found on Page 2 and Pages 45-48 of the lab report

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Some PFAS soils samples were subject to target and non-target analyte matrix interference and re-extraction and reanalysis was required

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Corrective actions are documented in the case narrative and following the effected samples

d. What is the effect on data quality/usability according to the case narrative?

Comments:

In many cases the Limit of Detection (LOD) is above the ADEC cleanup level

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CS Site Name:

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5. Samples Results

   a. Correct analyses performed/reported as requested on COC?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Full list of PFAS compounds by EPA 537M, GRO by AK 101, DRO by AK 102, DRO by AK 103, BTEX by EPA 8021B and TOC by EPA 9060A |

   b. All applicable holding times met?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| All holding times were met |

   c. All soils reported on a dry weight basis?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Soil samples are reported on a dry weight basis. The % solids are shown in the lab report |

   d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

      Yes☐ No☒ N/A☐ Comments:

| |
|---|
| Often LOQs for PFOA and PFOS are above ADEC Method 2 MTG cleanup levels. However, in all instances the LOQs are below the ADEC Human Health cleanup levels. Samples with LODs (1/2 the LOQ) above ADEC cleanup levels are highlighted blue in the results tables. The LOQs for benzene and ethylbenzene are above ADEC Method 2 MTG cleanup levels |

   e. Data quality or usability affected?

| |
|---|
| Data quality or usability not affected as PFAS impacts are ubiquitous at the site and many of the “detectable” samples are above ADEC Method 2 MTG cleanup levels. However, benzene and ethylbenzene cannot be compared to ADEC Method 2 MTG cleanup levels |

6. QC Samples

   a. Method Blank

      i. One method blank reported per matrix, analysis and 20 samples?

      Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Method blank results are shown in the lab report |

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| 1204074 |

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| TBD |

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

| |
|---|
| The PFAS method blank had detectable concentrations of Perfluorobutanoic Acid |

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

| |
|---|
| All samples analyzed for Perfluorobutanoic Acid samples in the lab report are affected. However, Perfluorobutanoic Acid is not a regulated PFAS compound |

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☐ Comments:

| |
|---|
| The affected samples are not flagged. However, affected samples are shown on the Method Blank summary page of the lab report |

v. Data quality or usability affected?

Comments:

| |
|---|
| Data quality and usability 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☐ N/A☐ Comments:

| |
|---|
| Note. SGS Orlando refers to these samples as Instrument Blanks |

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

| |
|---|
| No project soil metals or inorganics samples |

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| All %R are within method and lab limits for this project |

| |
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| TBD |

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| The RPD for the LCS/LCSD samples are within method and lab limits |

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

| |
|---|
| No affected samples |

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

| |
|---|
| No affected samples |

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

| |
|---|
| Data quality and usability not affected |

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

**Note: Leave blank if not required for project**

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Results are shown in the lab report |

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

| |
|---|
| No project soil metals or organics samples |

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

| |
|---|
| All %R for PFOS (sample FA77769-4) was outside control limits due to high concentrations in parent sample |

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☒ No☐ N/A☐ Comments:

All RPDs are less than the method or lab limits

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

FA77769-4 (lab id) – affected project samples are shown on Pages 89-90 in the lab report

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

Yes. Data flags indicate the %R outside control limits and RPD impacted by matrix interference

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☐ N/A☒ Comments:

No IDA

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

No IDA

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No IDA

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

iv. Data quality or usability affected?

Comments:

N/A as there was no IDA

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☒ N/A☐ Comments:

Trip blank results are shown on Page 21 of the lab report

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☐ N/A☐ Comments:

The cooler ID is shown on the CoC

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☒ Comments:

All LOQs are less than the ADEC Method 2 MTG cleanup levels for GRO/BTEX

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

No affected samples

v. Data quality or usability affected?

Comments:

Data quality or usability not affected

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

T1-XXX is a blind duplicate of T1-27A and T1-XXXX is a blind duplicate for T1-39A (for PFAS samples); T-YY is a blind duplicate for T1-39A (for hydrocarbons)

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

All field duplicates were submitted blind to the lab

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where $R_1$ = Sample Concentration
$R_2$ = Field Duplicate Concentration

Yes☐ No☒ N/A☐ Comments:

T1-XXX/T1-27A PFOA RPD = 48.46% and 30.77 PFOS RPD = 64.92%; T1-XXXX/T1-39A PFOA RPD= 21.63% and PFOS RPD = 97.96%; T1-YY/T1-39A DRO RPD = 48.76% RRO RPD = 52.44% Toluene RPD = 38.23%

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality and usability not affected as RSE used the higher of the two results in the UCL calculator and other discussions

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☒ N/A☐ Comments:

No decon or equipment blank samples for this project

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decon or equipment blank samples for this project

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No affected samples

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

iii. Data quality or usability affected?

Comments:

Data quality and usability not affected

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

Data flags indicate the re-extraction, reanalysis and which run data was used in the lab report, as well as which samples are impacted by matrix interference

# Laboratory Data Review Checklist

Completed By:

Lucus Gamble, QEP

Title:

Environmental Sciences Manager

Date:

September 15, 2020

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1204107

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

ADEC File Number:

TBD

Hazard Identification Number:

TBD

1204107

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

**Note: Any N/A or No box checked must have an explanation in the comments box.**

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   SGS North America Inc.

   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☐ N/A☐ Comments:

   PFAS samples were transferred to SGS Orlando

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   A copy of the CoC is provided with the lab report

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

   PFAS by EPA 537M, GRO by AK 101, DRO by AK 102, RRO by AK 103, BTEX by EPA 8021B, TOC by EPA 9060A

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Temperature Blank = 3.0° C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☒ Comments:

   GRO/BTEX was preserved using methanol

1204107

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

See page 32 of the lab report. Samples were 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☒ N/A☐ Comments:

There are no discrepancies noted

e. Data quality or usability affected?

Comments:

Data quality or usability not affected

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

Case narratives are found on Page 2 and Pages 37-38 of the lab report

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Some PFAS soils samples were subject to target and non-target analyte matrix interference and re-extraction and reanalysis was required. In certain instance dilution was required.

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Corrective actions are documented in the case narrative and following the effected samples

d. What is the effect on data quality/usability according to the case narrative?

Comments:

In many cases the Limit of Detection (LOD) is above the ADEC cleanup level

1204107

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

Full list of PFAS compounds by EPA 537M, GRO by AK 101, DRO by AK 102, DRO by AK 103, BTEX by EPA 8021B and TOC by EPA 9060A

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

All holding times were met

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

Soil samples are reported on a dry weight basis. The % solids are shown in the lab report

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☒ N/A☐ Comments:

Often LOQs for PFOA and PFOS are above ADEC Method 2 MTG cleanup levels. However, in all instances the LOQs are below the ADEC Human Health cleanup levels. Samples with LODs (1/2 the LOQ) above ADEC cleanup levels are highlighted blue in the results tables. Benzene and ethylbenzene LOQs exceed ADEC Method 2 MTG cleanup levels

e. Data quality or usability affected?

Data quality or usability not affected as PFAS impacts are ubiquitous at the site and many of the "detectable" samples are above ADEC Method 2 MTG cleanup levels. However, benzene and ethylbenzene cannot be compared to ADEC Method 2 MTG cleanup levels

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

Method blank results are shown in the lab report

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Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

The PFAS method blank had detectable concentrations of Perfluorobutanoic Acid

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

All samples analyzed for Perfluorobutanoic Acid samples in the lab report are affected. However, Perfluorobutanoic Acid is not a regulated PFAS compound

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☒ N/A☐ Comments:

The affected samples are not flagged. However, affected samples are shown on the Method Blank summary page of the lab report

v. Data quality or usability affected?

Comments:

Data quality and usability 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☐ N/A☐ Comments:

Note. SGS Orlando refers to these samples as Instrument Blanks

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No project soil metals or inorganics samples

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

All %R are within method and lab limits for this project

1204107

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

The RPD for the LCS/LCSD samples are within method and lab limits

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No affected samples

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No affected samples

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability not affected

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

**Note: Leave blank if not required for project**

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

Results are shown in the lab report

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No project soil metals or organics samples

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

All %R for PFOS (sample FA77769-4) was outside control limits due to high concentrations in parent sample

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| 1204107 |

Laboratory Report Date:

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| September 3, 2020 |

CS Site Name:

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| TBD |

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

| |
|---|
| The RPD was outside of the lab limits due to matrix interference |

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

| |
|---|
| FA77769-4 (lab id) – affected project samples are shown on Pages 63-64 in the lab report |

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Yes. Data flags indicate the %R outside control limits and RPD impacted by matrix interference |

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

| |
|---|
| Data quality and usability not affected |

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☐ No☐ N/A☒ Comments:

| |
|---|
| No IDA |

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☐ N/A☒ Comments:

| |
|---|
| No IDA |

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

| |
|---|
| No IDA |

| |
|---|
| 1204107 |

Laboratory Report Date:

| |
|---|
| September 3, 2020 |

CS Site Name:

| |
|---|
| TBD |

iv. Data quality or usability affected?

Comments:

| |
|---|
| N/A as there was no IDA |

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☒ N/A☐ Comments:

| |
|---|
| Trip blank results are shown on Page 16 of the lab report |

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☐ N/A☐ Comments:

| |
|---|
| The cooler ID is shown on the CoC |

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☒ Comments:

| |
|---|
| All LOQs are less than the ADEC Method 2 MTG cleanup levels for GRO/BTEX |

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

| |
|---|
| No affected samples |

v. Data quality or usability affected?

Comments:

| |
|---|
| Data quality or usability not affected |

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| T2-X is a blind duplicate of T2-01A |

1204107

Laboratory Report Date:

September 3, 2020

CS Site Name:

TBD

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

All field duplicates were submitted blind to the lab

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where $R_1$ = Sample Concentration
$R_2$ = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

T2-X/T2-01A PFOA RPD = 0% and PFOS RPD = 4.47%

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality and usability not affected

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☒ N/A☐ Comments:

No decon or equipment blank samples for this project

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decon or equipment blank samples for this project

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No affected samples

| |
|---|
| 1204107 |

Laboratory Report Date:

| |
|---|
| September 3, 2020 |

CS Site Name:

| |
|---|
| TBD |

iii. Data quality or usability affected?

Comments:

| |
|---|
| Data quality and usability not affected |

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

| |
|---|
| Data flags indicate the re-extraction, reanalysis and which run data was used in the lab report, as well as which samples are impacted by matrix interference |

## Appendix G – Copies of RSE Field Notes

8/6/20 K.W. L.K 20-2176 (1)

57°F
OVERCAST

0841 - ON SITE, SAFETY TALK, WALKING SURFACE, HYDRATION, PINCH POINTS, PFAS GENERAL.
- BRYCE FROM GEOTECH HELPER

0852 - SET UP AT SB-33

0853 - CALIBRATE RSC PID WITH 100 PPM $C_4H_8$, GOOD CAL (100.0)
CAL CHECK 98.0 PPM (GOOD)

0915 - USE HAND AUGER TO 5.5' BGS
MATERIAL IS DARK BROWN, DARK RED BROWN PEAT, ORGANICS. COLLECT $\boxed{\text{T1-33A}}$, GRO, DRO, PFAS + H.S., $\boxed{\text{PID} = 0.9 \text{ PPM}}$ $\boxed{0915}$

0944 - DRIVE TO 7' BGS, ENCOUNTER RESISTANCE, RECOVER 75% OF SLEEVE, DARK RED BROWN PEAT, GREY/M... SILT WITH SD AT 7', COLLECT $\boxed{\text{T1-33B}}$ $\boxed{0945}$ GRO, PFAS, 1/2 OF DRO, NEED MORE FOR OTHER 1/2 DRO + H.S. USE TOOLING FROM 5.5' TO 7' AGAIN. RECOVER 1/2 SLEEVE. DARK RED BROWN PEAT, SILT AT THE BOTTOM (GREY)
COLLECT 1/2 DRO + H.S. $\boxed{\text{PID} = 0.5 \text{ PPM}}$

1007 - PACK UP TO MOVE TO SB-31

1023 - AT SB-31

1042 - HAND AUGER TO FROM 1.0' TO 5.5'.
DARK RED BROWN PEAT, WET, COLLECT $\boxed{\text{T1-31A}}$ $\boxed{1023}$
GRO, DRO, PFAS, HS $\boxed{\text{PID} = 0.9 \text{ PPM}}$

1032 - DRIVE TO 10' BGS, 75% RECOVERY, DARK RED BRN PEAT, ORGANICS, NEED MORE MATERIAL MAKE 2ND DRIVE TO 10' BGS

1056 - DRIVE 10' BGS, 10% RECOVERY, COLLECT $\boxed{\text{T1-31B}}$ $\boxed{1100}$
GRO, DRO, PFAS, NEED MORE MATERIAL FOR ...
DRIVE AGAIN TO 10' ——— K

1102 - 3RD DRIVE TO 10', 10% RECOVERY, HS. PID= 0.8 PPM

1112 - PACK UP, MOVE TO SB-35.

1133 - SB35: HAND AUGER TO 5.5' MATERIAL IS DARK TO MEDIUM BROWN PEAT

1140 - COLLECT TI-35A 1140 GRO, DRO, PFAS, HS PID = 1.1 PPM

1150 - DRIVE FROM 5.5' TO 10', 90% RECOVERY DARK RED BROWN PEAT, COLLECT TI-35B 1150 GRO, PFAS, DRO, HS PID = 0.7 PPM

1205 - CLEAN UP, MOVE TO SB-~~2~~1

1225 - AT SB 21

1234 - HAND AUGER TO 5.5' BGS, DARK BROWN PEAT, WET

1241 - DRIVE FROM 5.5' TO 10' BGS DARK RED BROWN [illegible], [illegible] RECOVERY, 10% [illegible]

[illegible]

1235 - COLLECT TI [illegible] 1235 FROM 1 - 5.5' [illegible] PID = [illegible] PPM

1245 - [illegible] 1245 FROM [illegible] 10' GRO, DRO [illegible], PID = 1.3 PPM

1309 - AT SB-37.

1318 - HAND AUGER TO 5.5', DARK BROWN PEAT, DAMP LOWER

1320 - COLLECT TI-37A, GRO, DRO PFAS HS PID = 2.0 PPM

1328 - DRIVE FROM 5.5' TO 10' BGS, 100% RECOVERY DARK RD BROWN PEAT

1335 - COLLECT TI-37B, GRO, DRO, PFAS, HS PID = 1.9 PPM

JC

8/6/20 KW LK 20-2176

1347 - CLEAN UP AT SB-37,

1353 - AT SB-29

1358 - HAND AUGER FROM 1' TO 5.5' DK-MED BRN PEAT

1400 - collect T129A (1400), GRO, DRO, PFAS, H/S PID = 1.8 PPM

1408 - DRIVE FROM 5.5' TO 10', 0% RECOVERY,

1410 - DRIVE AGAIN, 20% RECOVERY, DR, RD BRN PEAT.

1415 - DRIVE AGAIN, ~5% RECOVERY,

1420 - collect T129B (1420), PFAS ONLY, LESS THAN 4oz RECOVERY TOTAL

1445 - AT SB-19,

1450 - HAND AUGER FROM 1' TO 5.5' BGS
DARK BRN PEAT

1455 - collect T1-19A 1455 GRO, DRO + DUP T1-Y 1500
collect T1-19A 1455 PFAS + DUP T1-X 1457
+ H.S. PID = 0.3 PPM

1502 - DRIVE FROM 5.5' TO 10' BGS, 10% RECOVERY

1505 - DRIVE AGAIN, < 5%

1510 - DRIVE AGAIN, 0% RECOVERY DK BRN PEAT

1515 - collect T1-19B (1515), PFAS only, ~1 oz RECOVERED TOTAL
1/4 VOLUME OF JAR

1542 - RUN DECON WATER THROUGH GAC ONSITE

1604 - DEPART SITE

DRAFT

①

8/7/20 20-2176 K.W w/BRYCE 60°F
SUN WITH CLOUDS

0922 - ON SITE

0932 - CALIBRATE RSE PID WITH 100 PPM $C_4H_8$, GOOD CAL (100.0 PPM) CAL CHECK 98.5 PPM (GOOD)

0940 - AT SB-17.

0951 - HAND AUGER TO 5.5' BGS, DARK TO MEDIUM BROWN PEAT, MOIST,

0955 - COLLECT $\boxed{\text{T1-17A}}$ 0955 (GRO, DRO, PFAS, H.S. $\boxed{\text{PID = Ø.7 PPM}}$

1002 - DRIVE TO 9.5', ENCOUNTER WOOD, 60% RECOVERY. DARK RED BROWN PEAT, FIBROUS,

1009 - L.K. ONSITE

1010 - REDRIVE TO 9.75', LOWER ~6" ARE 50/50 SD/SCT GREY

1015 - COLLECT $\boxed{\text{T1-17B}}$ $\boxed{\text{1015}}$ GRO, DRO, PFAS, HS. $\boxed{\text{PID = 0.5 PPM}}$

1035 - AT SB-15.

1046 - HAND AUGER FROM 1' TO 1.5', DARK TO MEDIUM BROWN PEAT

1052 - AUGER TO 2', ENCOUNTER MEDIUM GREY, MEDIUM GRAIN SAND WET.

1057 - AUGER TO 2.5', RECOVER GREY SAND, MINOR ORGANICS MOVE OVER 10', DRIVE NEW HOLE TO 1'.

1104 - DRIVE TO 4' BGS AT SB-15NW, RECOVER 100% (50% PEAT. LOWER 50% GREY SAND) DISCARD BACK DOWN HOLE.

1110 - COLLECT $\boxed{\text{T1-15A}}$ $\boxed{\text{1110}}$ FROM SB-15 1' TO 2' PEAT, GRO, DRO, PFAS H.S $\boxed{\text{PID = Ø.7 PPM}}$

KW

8/7/20 20-2176 KU. LK. (2.)

W/ BRYCE

1138 - AT SB-03

1155 - HAND AUGER FROM 1' TO 5.5' BGS
MEDIUM BROWN PEAT REDDISH HUE, SPONGE LIKE

1200 - COLLECT $\boxed{\text{TI-03A}}\boxed{1200}$ GRO, DRO, PFAS, H.S. $\boxed{\text{PID = 1.2 PPM}}$

1207 - DRIVE TO 7' BGS, 50% RECOVERY, LOWER 6" IS GREY WET SAND, PEAT TO 6.5' BGS, PEAT IS DK BRN, < 2 OZ, COLLECT $\boxed{\text{TI-03B}}\boxed{1210}$ PFAS ONLY (1/2 JAR).

1216 - LUNCH

1256 - AT SB-13

1300 - GW 2" BGS, AUGER TO 5.5' (TWICE)
DARK BROWN PEAT WET

1310 - COLLECT $\boxed{\text{TI-13A}}\boxed{1305}$ GRO, DRO, PFAS, H.S. $\boxed{\text{PID = Ø.9 PPM}}$

1315 - DRIVE FROM 5.5' TO 10' BGS, 50% RECOVERY, LOWER 50% IS GREY SAND, WET, OTHER 50% (25% OF SLEEVE) IS MED BRN PEAT, FIBEROUS

1315 - COLLECT $\boxed{\text{TI-13B}}\boxed{1315}$, PFAS ONLY, ~2 OZ, 1/2 JAR

1326 - AT SB-05

1328 - HAND AUGER FROM 1' TO 3.5'

1334 - AUGER TO 5.5' BGS, DARK BROWN PEAT

1335 - COLLECT $\boxed{\text{TI-05A}}\boxed{1335}$ GRO, DRO, PFAS, H.S, $\boxed{\text{PID = 1.2 PPM}}$

1344 - DRIVE TO 10' BGS, 60% RECOVERY, LOWER 2" IS GREY SLT/SD 50/50. DARK BRN PEAT REDDISH HUE.

1345 - COLLECT $\boxed{\text{TI-05B}}\boxed{1345}$ GRO, PFAS (1/2 JAR), DRO (3/4 JAR), H.S. $\boxed{\text{PID = 1.1 PPM}}$

KW

3

8/7/20 20-2176 KW L.K
W/ BRYCE

1403 - AT SB-11

1407 - AUGER TO 3.5' FROM 1', DARK BRN PEAT FIBEROUS,

1415 - AUGER TO 5.5' BGS DARK BRN PEAT

1415 - COLLECT $\boxed{TI-11A}$ $\boxed{1415}$ GRO, DRO, PFAS, H.S. $\boxed{PID=2.8 \text{ PPM}}$
+ COLLECT PFAS DUP $\boxed{TI-XX}$ $\boxed{1420}$

1424 - DRIVE FROM 5.5' TO 10' BGS, 80% RECOVERY, LOWER 3" IS VERY DENSE GREY CLAY, 3" OF GREY SD ABOVE CLAY, 6" OF NON PEAT TOTAL AT BOTTOM, REDRIVE FOR VOLUME

1430 - REDRIVE TO 10', 80% RECOVERY, LOWER 6" IS SD + CLAY, PEAT IS DARK TO MEDIUM BRN,

1435 - COLLECT $\boxed{TI-11B}$ $\boxed{1435}$ GRO, DRO, PFAS, HS.
$\boxed{PID = 1.3 \text{ PPM}}$

1505 - AT PARKING AREA, LEFT TOOLING SLED AT SB-27 FOR RESUME MONDAY.
USE GAC TO DISPOSE OF DECON WATER ON SITE.

1515 - DEPART

KW

DRAFT

①

8/10/20 RW. LR 20-2176 60°F OVERCAST

0838 - ON SITE

0839 - CALIBRATE RSL PID WITH 100 PPM $C_4H_8$, GOOD, 100.0 PPM
CAL CHECK, 98.7 PPM, GOOD.

0909 - AT SB-27

0912 - AUGER FROM 1' TO 4'. DARK BRN PEAT, WET.

0914 - AUGER TO 5.5', DARK BRN PEAT, MOIST

0915 - COLLECT TI-27A 0915 GRO, DRO, PFAS, H.S., PID=0.9 PPM
+ TI-XXX PFAS DUP.
0920

0936 - DRIVE TO 10' BGS, 75% RECOVERY, LOWER
6" IS GRY VERY DENSE CLAY. ~4 OZ DARK BRN
PEAT RECOVERY, RE-DRIVE

0954 - REDRIVE TO 9.8', ~50% RECOVERY, LOWER 4" IS
GRY DENSE CLAY, ~2 OZ OF DARK BRN PEAT
RECOVERED.

DRAFT

1000 - TI-27B 1000 GRO, 3/4 DRO JAR, 1/2 PFAS JAR +
H.S. PID=1.0 PPM

1025 - AT SB-23, HAND AUGER FROM 1' TO 3.5' BGS, GW AT
SURFACE.

1036 - HAND AUGER TO 5.5' BGS, DARK BRN PEAT

1041 - COLLECT TI-23A 1040 GRO, DRO, PFAS, H.S. PID=0.8 PPM

1042 - DRIVE TO 7' BGS, ENCOUNTER RESISTANCE, 60%
RECOVERY, LOWER 6" IS GREY SILT TRENDING TO CLAY
WITH DEPTH, MED TO DARK BRN PEAT ~4 OZ RECOVERED.

8/10/20 KW. LK. 20-2176 ②

1050 - REDRIVE TO 7.5' BGS.

1056 - RECOVER ~90% DARK TO MEDIUM BRN PEAT
TRACE SLT/CLAY AT SHOE.

1103 - COLLECT $\boxed{TI-23B}$ $\boxed{1100}$ GRO, DRO, PFAS, HS $\boxed{PID = 1.0 ppm}$

1123 - AT SB-Ø7.

1125 - AUGER FROM 1' TO 2' BGS, DK BRN PEAT

1136 - AUGER TO 3.5' THEN AGAIN TO 5.5' BGS
DARK BRN PEAT MOIST → DAMP.

1141 - COLLECT $\boxed{TI-Ø7A}$ $\boxed{1135}$ GRO, DRO, PFAS, HS $\boxed{PID = 4.2 ppm}$

1152 - DRIVE TO 7' BGS, 90% RECOVERY, DENSE GREY CLAY + SLT
IN LOWER 6", MEDIUM REDDISH BRN PEAT ~60% RECOVERED

1156 - REDRIVE TO 7' BGS

1159 - 60% RECOVERY, MED RED BRN PEAT, ~1" SLT/CLAY AT
BOTTOM.

1200 - COLLECT $\boxed{TI-Ø7B}$ $\boxed{1200}$ GRO, DRO, PFAS, HS $\boxed{PID = 1.4 ppm}$

1220 - AT SB-09, HAND AUGER TO 1' BGS, 0.5' → 1'
IS LIGHT TAN, BUFF, DRY, SLT. $\boxed{NO SAMPLE}$

1232 - AT SB25. HAND AUGER TO 2' BGS, 1'-2'
IS MED GREY BRN SLT $\boxed{NO SAMPLE}$

LUNCH.

1321 - AT SB-39

KW

8/10/20 KW. L.K. 20-2176 3

1327 - AUGER TO 2' BGS, MED BRN SLT

1334 - AUGER TO 5' THEN AGAIN TO 5.5'
DARK RED BRN PEAT.

1343 - COLLECT $\boxed{\text{T1-39A}}$ GRO, DRO, PFAS, HS $\boxed{\text{PID = 3.7 PPM}}$
+ DUP $\boxed{\text{T1-YY}}$ $\boxed{\text{1340}}$ GRO, DRO + PFAS
DUP $\boxed{\text{T1-XXXX}}$ $\boxed{\text{1345}}$

1346 - DRIVE TO 8' BGS, 90% RECOVERY, LOWER
4" IS GREY DENSE CLAY.

1353 - COLLECT $\boxed{\text{T1-39B}}$ $\boxed{\text{1350}}$ GRO, DRO, PFAS, HS $\boxed{\text{PID = 2.7 PPM}}$

1436 - AT POSTMARK DRIVE, GAC DECON LATER.

1512 - DEPART.

8/11/20 KW LK. 20-2176

58°F
OVERCAST
RAIN.

0842 - ONSITE

0850 - RECON AT SB-Ø7

0858 - AUGER TO 7.1' BGS, MEDIUM BRN VERY FINE TO FINE SAND. NO PEAT $\boxed{\text{NO SAMPLE}}$

0913 - TRAVERSE AND LOCATE T2-03 + T2-01

0917 - AUGER AT T2-03

0946 - DEVELOP PLAN TO ACCESS T2-03 - T2-01

0951 - CALIBRATE RSE PID WITH 100 PPM $C_4H_8$, GOOD CAL, CAL CHECK, 98.6 PPM (GOOD)

1020 - AT T2-01

1035 - AUGER TO 5.5' BGS, DK - MED BRN PEAT, RED HUE

1044 - COLLECT $\boxed{\text{T2-Ø1A}}$ $\boxed{\text{1035}}$ GRO, DRO, PFAS, HS. $\boxed{\text{PID = Ø.4 PPM}}$ + DUP PFAS $\boxed{\text{T2-X}}$ $\boxed{\text{1040}}$

1045 - DRIVE TO 8' BGS, 75.8 RECOVERY, BOTTOM 3" IS BRN-GRY SAND + SILT TRENDING TO GREY SAND-SILT. PEAT IS MED-DK BRN, RED HUE, FIBEROUS

1054 - COLLECT $\boxed{\text{T2-Ø1B}}$ $\boxed{\text{1050}}$ GRO, DRO, PFAS $\boxed{\text{PID = Ø.5 PPM}}$

1114 - AT T2-03

1126 - AUGER TO 3' BGS ENCOUNTER GREY SAND, PEAT RECOVERED IS DARK BRN,

1133 - COLLECT $\boxed{\text{T2-03A}}$ $\boxed{\text{1130}}$ GRO, DRO, PFAS $\boxed{\text{PID: 0.4 PPM}}$

1154 - GAC DECON WATER ONSITE.

1208 - DEPART.

# NEPA INTERIM CONTAMINATED MATERIALS MANAGEMENT PLAN

Alaska Cargo and Cold Storage

DOWL Project Number: 1138.63279.01

**Prepared for:**

McKinley Capital Management, LLC
3800 Centerpoint Drive, STE 1100
Anchorage, AK 99503

**Prepared by:**

5015 Business Park Blvd
Anchorage, AK 99503

# TABLE OF CONTENTS



# FIGURES



# APPENDICES

# ACRONYMS AND ABBREVIATIONS

Applicant ........ McKinley Capital Management, LLC
Project ........ Alaska Cargo and Cold Storage
ADEC ........ Alaska Department of Environmental Conservation
CMMP ........ Contaminated Material Management Plan
PFAS ........ Per – and Polyfluoroalkyl
ANC ........ Anchorage International Airport
AIA ........ Alaska International Airport
ARFF ........ Aircraft Rescue and Firefighting
CWA ........ Clean Water Act
mg/kg ........ milligrams per kilogram
ng/L ........ nanograms per liter
NFS ........ Non-Frost Susceptible
CAC ........ Colloidal Activated Carbon
PAC ........ Powder Activated Carbon
PPE ........ Personal Protective Equipment

# 1. INTRODUCTION

## 1.1 Purpose

On behalf of McKinley Capital Management, LLC (Applicant), DOWL prepared the following National Environmental Policy Act (NEPA) Interim Contaminated Materials Management Plan (CMMP) for the Alaska Cargo and Cold Storage Project (Project) supporting planning of Per – and Polyfluoroalkyl Substance (PFAS) contaminated soil and water handling and remediation. This NEPA Interim CMMP will support the NEPA documentation required for the ACCS project and provide an initial approach for contaminated soil and water handling and remediation. A Final CMMP will be provided at a later date to support the Applicants pursuit of an ADEC Excavation Dewatering General Permit (AKG002000) required for project construction. The proposed project is located at Ted Stevens Anchorage International Airport (ANC) in Anchorage, Alaska (Figure 1).


*Figure 1: Project Location and Vicinity*

The NEPA Interim CMMP is intended to describe proposed remediation methodology for PFAS contaminated soil, groundwater, and surface water encountered during construction of the Alaska Cargo and Cold Storage Project. The Project will develop the site to accommodate the growing need for cargo and climate-controlled warehouse infrastructure at ANC. A new, approximately 29-acre concrete pad would be constructed to support the warehouse, parking apron, possible hardstand fueling locations, airside and landside loading areas, outdoor storage, vehicle parking, and emergency and maintenance vehicle access around the building (Figure 2).

The Project is proposed at Postmark Bog, a peat bog that is currently covered by grasses, mosses, and low brush. Prior to construction of the pad, the site would be cleared, and overburden would remain on site mostly undisturbed. The peat bog would require surcharging to create substrate stability over which a concrete apron pad could be built. Additionally, trenching would be needed for water and sewer utilities within the project area to the proposed warehouse. Utilities under the proposed warehouse would hang from the building's concrete structural foundation and would not require trenching. Electricity and telephone/internet would be "ditch witched" in small trenches to the warehouse building. Excavated materials, resulting from trenching for utilities and the rehabilitation trench (see section 3.1), will be backfilled to mitigate contamination off site. There will be no requirements for on or off-site PFAS contaminated soil storage or treatment.

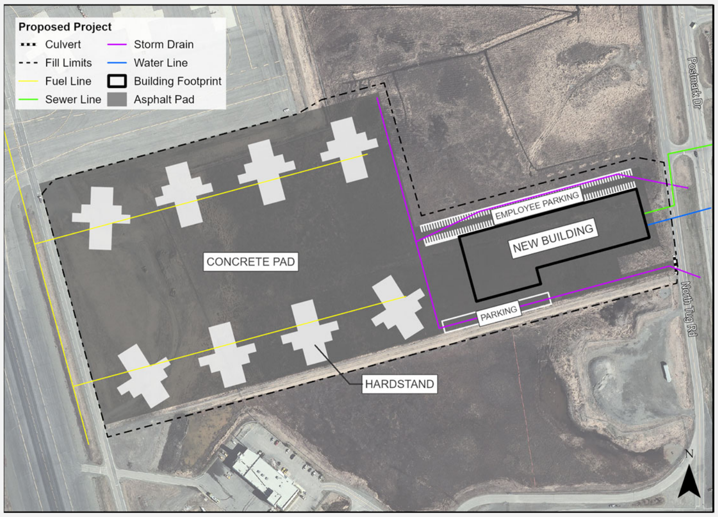


*Figure 2: Alaska Cargo and Cold Storage Project*

PFAS is not a currently monitored effluent under the Clean Water Act (CWA), and as such interim action levels have been established by the ADEC informed by the Environmental Protection Agency's (EPA) guidance based on Lifetime Health Advisory (LHA) for PFAS substances (ADEC 2019). Based upon multiple prior PFAS sampling events at the Project site, the soil and water samples are consistently contaminated above ADEC action levels. Soil contamination limits set for Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonate (PFOS) are 0.0017/0.003 mg/kg, respectively. Water contamination action levels are set collectively for PFAS contamination (PFOA and PFOS) at 70 ng/L(ADEC 2022, attached Appendix A).

Surface water inundation can be observed on aerial imagery and on site at Postmark Bog throughout the area. Groundwater monitoring wells in the surrounding Postmark Bog area has been measured at around 100 feet below ground surface (ADEC 2022, attached Appendix A), subsequently the geomorphology of the area supports that surface water and ground water perched above the underlying confining clay later, sourced from precipitation and snow storage on the south side of the Postmark Bog, will be impacted by the project. Encountering, handling, and treating PFAS contaminated water is the primary anticipated concern of the CMMP and dewatering permit during the construction process for the Project.

## 1.2 Site History

In 2019, a site characterization at the Aircraft Rescue and Fire Fighting (ARFF) building indicated PFOS contamination at 23,000 ppt in shallow groundwater, 6,600 ppt in surface water, and 0.18 mg/Kg in soil. The ARFF building is located adjacent to the southwest of the Project. The Project is likely affected from releases of Aqueous Firefighting Foam, which is a known contributor to PFAS contamination. According to the ADEC site report on the Alaska International Airport (AIA) ARFF Building Site (status: active, hazard ID 27137), the last entry in the ADEC site summary is an approval of a site characterization work plan describing sampling of soil, groundwater, and surface water around Postmark Bog. According to the most recently published January 2022 Site Characterization Report (ADEC 2022, attached Appendix A) the following sampling events have taken place at Postmark Bog (including within the Project site):

- June 2019—PFAS was sampled from surface water from 3 locations and two soil samples in or near the Postmark Bog
- December 2019—Sampled for PFAS in near-surface water from a Piezometer near the center of Postmark Bog
- February 2020--Sampled 5 surface soil borings for PFAS from Postmark Bog on behalf of Alaska Cold Storage potential future development
- February 2020—2 PFAS Soil samples to gain information for a Postmark Drive construction project
- March 2020 “ANC Peat Disposal Area PFAS Sampling Results”—43 Primary PFAS Soil Samples
- August 2020—36 Primary PFAS Soil samples taken in Postmark Bog to aid future construction projects in Postmark Bog
- August 2021—Sampled PFAS from 7 existing groundwater monitoring locations for PFAS in the areas surrounding and within ARFF/Postmark Bog
- January 2022—Site Characterization Report (ADEC 2022, attached Appendix A) provides results from the sampling events as well as a detailed description of the Postmark Bog area

# 2. SCOPE

This NEPA Interim CMMP includes proposed procedures for remediating discharges of PFAS contaminated water during the land surcharge process, proposed procedures for remediating PFAS contaminated water that is encountered during below ground utility trenching, proposed procedures for handling PFAS contaminated soil expected within the Project Area, and proposed procedures for addressing potential future migration of PFAS contamination. The final CMMP and treatment approach for the remediation of PFAS will be coordinated with the selected contractor and ADEC through the Excavation Dewatering General Permit application process. Activities during construction subject to the recommended procedures include soil excavation, land surcharging, and associated dewatering. Recommendations are provided for equipment decontamination, health, and safety requirements, and reporting requirements. The procedures described in the CMMP do not preclude additional site or project specific requirements for protection of human health and the environment, and worker safety. The contractor is responsible for performing its own due diligence to ensure the safety of their personnel.

# 3. PROCEDURES

## 3.1 Land Surcharging, Passive Water Discharge

To construct the aviation infrastructure, the bog will require surcharging (placing fill on top of the land to compress the soils and sediments) to create the structural integrity for the proposed facilities. Fill material from a local permitted site will be placed on the bog to surcharge the land. As the surcharging occurs, contaminated bog water is expected to seep out. Placement of fill is anticipated to occur from one direction to encourage water to flow and seep out in a uniform and predictable manner. The fill will be amended with the PFAS treatment, described below.

The anticipated PFAS treatment approach would comprise of permeable filter barriers amended with a site-specific blend of activated carbon mixed with Non-Frost Susceptible (NFS) fill material. The amended NFS fill material will be placed into a remediation trench and additionally as portions of the construction infrastructure subbase. The site-specific blend of amendments will consist of a patented SourceStop™ (SourceStop) colloidal activated carbon (CAC), in conjunction with powdered activated carbon (PAC). The combined treatment approach would create a significant and long-term reduction in the leachability of PFAS by increasing the sorptive capacity of the NFS fill material, which will effectively minimize or eliminate the PFAS contamination migration potential. Essentially, the treatment adsorbs PFAS contamination, removing PFAS from water by the process of surcharging the bog soils to eliminate further displacement during construction activities, preventing, or drastically reducing discharge of PFAS contaminated water off-site. Areas utilizing the amended NFS fill material as part of the subbase (see attached Site Map) will help prevent PFAS contamination from vertically migrating upward as the fill material is placed directly over the Postmark Bog, acting to immobilize the PFAS contaminants.

The remediation trench is proposed to be located along the eastern portion of the parcel adjacent to Tug Road and act as an infiltration trench preventing PFAS contamination from horizontally migrating offsite (see attached Site Map). The trench will be excavated down to the underlying clay layer (approximately 6-feet into the clay-perched water table) while removing the Postmark Bog material and replacing it with the amended NFS fill material. The excavated material from the trench will be spread on-site as part of the surcharging process, upstream from the trajectory of the controlled passive water discharge and will not be removed from the site. This will ensure excavated contaminated PFAS soil and water from the trench will be mitigated from leaching out of the Project site.

The amended NFS fill material for the subbase and trench would consist of a homogeneous blend of PAC, CAC, and NFS fill materials. The amount of amended NFS fill material needed for surcharging and treating of surface ground water from Postmark bog is unknown at this stage in the design process, breakthrough calculations are anticipated to provide estimates on volume and ratios for the amended fill material. The current known procedures for the addition of PAC and CAC to the NFS fill material is generally conducted in 2-phases:

1. Mechanically mix in the PAC with standard heavy-construction equipment to promote even distribution throughout the fill material. This process can be done directly within the treatment area or separately within a stockpiled area then transferred to the treatment area for placement.

2. Spray apply the SourceStop to evenly coat the fill material while placing into the treatment area. When applying the SourceStop, turning over the fill material several times should be performed to further promote distribution and coating of the material.
   i) The SourceStop should be mixed with water in above-ground mixing tanks and spray applied using a high-volume water pump to facilitate the distribution in fully covering/coating the fill material. The spray application of SourceStop should coincide with incremental lifts during the PAC amended fill material placement.

## 3.2 Excavation, Active Water Discharge

Trenching required during project construction may percolate water from the surrounding bog. To facilitate the construction process and treat percolated PFAS contaminated water in an effective manner, a dedicated treatment vessel will be used. In the instances that the utility and/or rehabilitation trench begin ponding water, the water will be pumped to the treatment vessel. Prior to pumping any water, the appointed contactor will perform breakthrough calculations based on the volume of water requiring treatment in the vessel. Calculations will provide estimates on the required carbon treatment, while accounting for carbon adsorbed petroleum, and estimates of resident holding time. Testing and monitoring will occur per the stipulations outlined in the General Dewatering Permit (AKG002000) and discharged, immediately following treatment, without limitations.

Any equipment or machinery leaving the Project Area will be decontaminated by brushing off equipment with a designated bristle brush. Once visible soil and material are removed, a wet decontamination with Alconox® solution or sodium triphosphate would be performed, and rinsed twice with potable water, then de-ionized water and air dried.

Decontamination of the pumps and hoses will be achieved by the same method described above of running the Alconox® solution or sodium triphosphate through the pumps and hose(s), followed by potable water, then de-ionized water and air dried. Heavy equipment needed to excavate soils for utility installations, or soil excavation needed for any other reason, will not need decontamination until they are leaving the site. All excavated materials for utility installations will be staged on-site and then replaced from where they were removed. Excavated materials for the PFAS remediation trench will be spread on-site as part of the land surcharging.

# 4. HEALTH AND SAFETY

## 4.1 Site Security

The Project is located outside of the secure ANC Air Operations Area. Therefore, the contractor will install a fence to keep unauthorized personnel out of the construction area. The contractor will install signage on the fence that clearly identifies the presence of PFAS contamination. Additional signage and flagging will be used inside the fence to identify the trench containing the amended NFS fill material. The signs will consist of durable backboard with waterproof lettering that is readable for 20 feet away showing the contaminant of concern (in this case PFAS), point-of-contact (name and phone number) for the contractor and point-of-contact (name and phone number) for ANC environmental personnel (Appendix B). The signage must be maintained and readable for the entirety of project construction.

## 4.2 Worker Protection

Project personnel will receive site specific PFAS hazard awareness training developed by the selected PFAS remediation contractor. The construction contractor will keep a training log of all personnel who have received the training. Generally, the training will include basic information on PFAS compounds, potential pathway of exposure, human health effects, ecological concerns, equipment decontamination procedures, required PPE and proper PPE application and removal.

PPE will be required for all project personnel when working on the ground within the PFAS contaminated work zone. PPE requirements will be based on potential exposures and may include standard work clothes or coveralls, reflective or high visibility safety vests (or shirt or jacket), appropriate protective footwear, safety glasses, hard hat, work gloves, masks if dust is present, and disposable nitrile work gloves for workers who may touch PFAS contaminated soil.

# 5. REPORTING

The contractors will follow the reporting requirements of an ANC Storm Water Pollution Prevention Plan, ANC- General Permit (AKR061000), and an Excavation Dewatering General Permit (AKG002000).

# 6. REFERENCES

ADEC. 2019. *Action levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water.* Technical Memorandum, Alaska: ADEC.

ADEC. 2022. *ARFF Station/Postmark Bog ADEC File: 2100.38.028.39.* PFAS Site Characterization Report, Alaska: ADEC.

Regenesis. 2023. "Preliminary Proposal to Assist with PFAS Migration Prevention." Memorandum, Alaska.

Restoration Science & Engineering, LLC. 2022. *Taxiway Z West Expansion Project Containminated Materials Management Plan (CMMP).* CMMP, Alaska: CRW Engineering Group.


# Site Map

Anchorage Cold Storage Facility

DOWL

Date: November 27, 2023

Figure 1

\\ANC-FS\anc-projects\38\63279-01\60GIS\Carto\Environmental\Environmental.aprx Nov 27, 2023 10:33 AM User: charrington

# APPENDIX A: ADEC JANUARY 2022 SITE CHARACTERIZATION REPORT

Anchorage International Airport

# ARFF Station/Postmark Bog
# ADEC File: 2100.38.028.39
## January 2022 PFAS Site Characterization Report

## 1.0 INTRODUCTION

### 1.1 Objectives and Summary

This ARFF (Airport Rescue and Fire Fighting) Station/Postmark Bog PFAS Site Characterization Report is intended to summarize the findings of multiple sampling events that have taken place in the vicinity of the ARFFS Station/Postmark Bog within the last few years.

These events have included:

- **June 2019**—PFAS was sampled from surface water from 3 locations and two soil samples in or near the Postmark Bog.
- **December 2019**—Sampled for PFAS in near-surface water from a Piezometer near the center of Postmark Bog.
- **February 2020**--Shannon & Wilson sampled 5 surface soil borings for PFAS from Postmark Bog on behalf of Alaska Cold Storage potential future development.
- **February 2020**—2 PFAS Soil samples to gain information for a Postmark Drive construction project
- **March 2020** "ANC Peat Disposal Area PFAS Sampling Results"—43 Primary PFAS Soil Samples
- **August 2020**—36 Primary PFAS Soil samples taken in Postmark Bog to aid in future construction projects in Postmark Bog
- **August 2021**—Sampled PFAS from 7 existing groundwater monitoring locations for PFAS in the areas surrounding and within ARFF/Postmark Bog.

### 1.2 Site Layout and History

**Geology**:

Anchorage lies on the upper Cook Inlet-Susitna Lowland within a trough between the Alaska Range and the Chugach Mountains. The area has been extensively glaciated and numerous tills, moraines, glaciofluvial and estuarine deposits are associated with the several glacial advances.

Ted Stevens Anchorage International Airport is located at the head of the Cook Inlet, between Turnagain and Knik Arms. The airport lies on a plateau about 80 to 120 feet above seas level. The Postmark Bog is a relatively low-lying area that is underlain by estuarine deposits composed of silts and clays that compromise the cohesive unit of the Bootlegger Cove Formation. Below the Bootlegger Cove formation lie glacio-fluvial sands and gravels and glacial tills. The absence of glacio-fluvial deposits overlying the Bootlegger Cove formation indicates erosion of the material in some places. Ten feet or more of the sand may have been eroded from the site.

**Postmark Bog**:

The Postmark Bog lies between the North-South runway and Postmark Drive, and between Taxiway U to the north and Dehavilland Avenue to the south. The airport security fence runs along the northern and western edge of the Postmark Bog. The Postmark Bog is characterized by generally flat topography (Elevation 84 to 90 feet).

Site observations and utility locates performed in the past indicate that there are presently no known utilities crossing Postmark Bog. What appears to be an abandoned telephone utility pole remains in the north-west corner of Postmark Bog. Most of the known utilities lie along Postmark Drive to the east and Dehavilland Ave to the south. A fuel line extends north-south between Taxiway R and the security fence on the western edge of Postmark Bog.

Along the northern edge of the site some of the near surface sands have apparently been mined during the past. Spoil consisting of sands, silts, and clays appear to have been placed in some of these mined areas. Additionally, what appears to be a spoil berm runs along the western edge of the Postmark Bog.

The Postmark Bog is delineated and classified as a “Class A” wetland. About two-thirds of the Postmark Bog is considered to be a peat bog and is currently covered by mosses and low brush. The well-drained areas of the site have previously been covered with dense alder, spruce and poplar, but have been mostly cleared.

**Airport Rescue and Fire Fighting Station (ARFF)**:

The ARFF was built in 1990 on the south west corner of Postmark Bog. The building is supplied with tap water from Anchorage Water and Wastewater Utility (AWWU) and has drainages within the building that feed into the sanitary sewer. In January 2020, the drinking water was tested for PFAS, and results showed Non-Detect (ND) results for all 26 reportable PFAS analytes (including PFOA/PFOS). To the north of the ARFF building is a snow storage area that until 2017 was used several times a year as a source of FAA-mandatory Aqueous Film Forming Foam (AFFF) discharges and tests of the AFFF fire fighting equipment. This area is likely the point source origin of the PFAS that is within the Postmark Bog. In 2017, the FAA approved of, and the airport purchased AFFF testing equipment that does not require foam discharge. AFFF is no longer discharged into the environment surrounding the Postmark Bog.

**Surface Drainage**:

Generally, the water filling Postmark Bog originates from natural precipitation on-site and from the snow storage areas (**Figure 2**) north of the ARFF station and north of Dehavilland Ave. A fenced berm runs East-West, splitting the northern 2/3rds section of the Postmark Bog from the southern portion. This berm was constructed in 2008. The Southern section of Postmark Bog drains into a culvert that flows into a drainage culvert that parallels Postmark Drive and enters Cook Inlet to the North (**Figure 3**). The northern section of Postmark Bog flows to the Northeast Corner, where the drainage enters the same drainage culvert paralleling Postmark Drive. The drainage from the ARFF Station flows into storm drain inlets that also connect to the Postmark Drive storm drain system.

**Groundwater Flow**:

Groundwater Elevations were taken using 3 existing groundwater monitoring wells in the vicinity of the Postmark Bog and 2 piezometers that were installed in the area. Survey equipment was used to measure the elevation of the casing, and a water level meter was used to determine the exact elevation of groundwater. Groundwater is expected to flow in a northerly direction in the vicinity of the Postmark Bog. The results are presented in **Figure 3**.

## 1.3 Project Location

The Postmark Bog location is shown in **Figure 1**. It is located North of the Airfield Maintenance Building, and drainage from the Postmark Bog snow storage areas generally flows north and east through this bog.

# 2.0 Compiled Postmark Bog Area Results for PFAS

## Table 1: Soil Sample Results

| Sample Name | Sample Type | Sample Depth (Inches) | Report # | Date Sampled | Perfluoroheptanoic acid (PFHpA) ug/kg | Perfluorooctanoic acid (PFOA)ug/kg | Perfluorononanoic acid (PFNA)ug/kg | Perfluorohexanesulfonic acid (PFHxS)ug/kg | Perfluorooctanesulfonic acid (PFOS)ug/kg | Above DEC Limits for PFOA/PFOS (0.0017/0.003 ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| ARFF Snow Dump Soil | Soil | 3 | 320-51317-7 | 6/2019 | 0.00046 | 0.0013 | 0.00018 | 0.0046 | 0.18 | Yes |
| N Postmark Bog Soil | Soil | 3 | 320-51317-8 | 6/2019 | 0.0625 | 0.037 | ND | 0.0824 | 1.62 | Yes |
| S Postmark Bog Soil | Soil | 3 | 320-51317-9 | 6/2019 | 0.00236 | 0.00196 | ND | 0.00748 | 0.152 | Yes |
| SE Postmark Bog Soil | Soil | 3 | 320-51317-10 | 6/2019 | 0.0183 | 0.0151 | 0.00752 | 0.0503 | 1.31 | Yes |
| T1-03A | Soil | 40 | 1204021 | 8/7/2020 | ND | ND | ND | 0.001 | ND | No |
| T1-03B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | ND | No |
| T1-05A | Soil | 40 | 1204021 | 8/7/2020 | ND | ND | ND | 0.0138 | 0.0898 | Yes |
| T1-05B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | 0.0016 | ND | No |
| T1-07A | Soil | 40 | 1204021 | 8/7/2020 | 0.0025 | 0.002 | ND | ND | ND | Yes |
| T1-07B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | ND | No |
| T1-11A | Soil | 40 | 1204021 | 8/7/2020 | ND | ND | ND | 0.0169 | 0.0838 | Yes |
| T1-11B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | ND | No |
| T1-13A | Soil | 40 | 1204021 | 8/7/2020 | ND | ND | ND | 0.0176 | 0.0549 | Yes |
| T1-13B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | 0.0568 | Yes |
| T1-15A | Soil | 40 | 1204021 | 8/7/2020 | ND | ND | ND | 0.003 | 0.0083 | Yes |
| T1-17A | Soil | 40 | 1204021 | 8/7/2020 | ND | ND | ND | ND | ND | No |
| T1-17B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | ND | No |
| T1-19A | Soil | 40 | 1204021 | 8/7/2020 | 0.0079 | 0.0019 | ND | 0.0153 | 0.0312 | Yes |
| T1-19B | Soil | 100 | 1204021 | 8/7/2020 | 0.0158 | 0.0052 | 0.0025 | 0.0385 | 0.154 | Yes |
| T1-21A | Soil | 40 | 1204021 | 8/7/2020 | 0.0125 | 0.0043 | 0.0015 | 0.0347 | 0.079 | Yes |
| T1-21B | Soil | 100 | 1204021 | 8/7/2020 | 0.0026 | ND | ND | 0.006 | 0.0157 | Yes |
| T1-23A | Soil | 40 | 1204021 | 8/7/2020 | 0.0089 | 0.0031 | ND | 0.0104 | 0.0139 | Yes |
| T1-23B | Soil | 100 | 1204021 | 8/7/2020 | 0.0015 | ND | ND | ND | 0.0019 | No |
| T1-27A | Soil | 40 | 1204021 | 8/7/2020 | 0.0198 | 0.0141 | ND | 0.0882 | 0.33 | Yes |
| T1-27B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | 0.0056 | 0.0351 | Yes |
| T1-29A | Soil | 40 | 1204021 | 8/7/2020 | 0.0112 | 0.0042 | ND | 0.0294 | 0.0847 | Yes |
| T1-29B | Soil | 100 | 1204021 | 8/7/2020 | 0.0156 | 0.0051 | ND | 0.0341 | 0.111 | Yes |
| T1-31A | Soil | 40 | 1204021 | 8/7/2020 | 0.0051 | 0.0013 | ND | 0.008 | 0.0256 | Yes |
| T1-31B | Soil | 100 | 1204021 | 8/7/2020 | 0.0022 | ND | ND | 0.0044 | 0.009 | Yes |
| T1-33A | Soil | 40 | 1204021 | 8/7/2020 | 0.0012 | ND | ND | 0.0021 | 0.0025 | No |
| T1-33B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | 0.0018 | No |
| T1-35A | Soil | 40 | 1204021 | 8/7/2020 | 0.0025 | 0.0029 | 0.0022 | 0.0102 | 0.0436 | Yes |
| T1-35B | Soil | 100 | 1204021 | 8/7/2020 | ND | ND | ND | ND | 0.0052 | Yes |
| T1-37A | Soil | 40 | 1204021 | 8/7/2020 | 0.0109 | 0.0075 | 0.0028 | 0.0327 | 0.165 | Yes |
| T1-37B | Soil | 100 | 1204021 | 8/7/2020 | 0.0042 | ND | ND | 0.0079 | 0.0482 | Yes |

| Sample Name | Sample Type | Sample Depth (Inches) | Report # | Date Sampled | Perfluoroheptanoic acid (PFHpA) ug/kg | Perfluorooctanoic acid (PFOA)ug/kg | Perfluorononanoic acid (PFNA)ug/kg | Perfluorohexanesulfonic acid (PFHxS)ug/kg | Perfluorooctanesulfonic acid (PFOS)ug/kg | Above DEC Limits for PFOA/PFOS (0.0017/0.003 ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| T1-39A | Soil | 40 | 1204021 | 8/10/2020 | 0.0211 | 0.0268 | ND | 0.263 | 0.363 | Yes |
| T1-39B | Soil | 100 | 1204021 | 8/10/2020 | ND | ND | ND | 0.045 | 0.0951 | Yes |
| T2-01A | Soil | 40 | 1204021 | 8/10/2020 | ND | 0.0017 | ND | 0.0063 | 0.0743 | Yes |
| T2-01B | Soil | 100 | 1204021 | 8/10/2020 | ND | ND | ND | ND | 0.0056 | Yes |
| T2-03A | Soil | 40 | 1204021 | 8/10/2020 | 0.0012 | 0.0011 | ND | 0.0055 | 0.0095 | Yes |
| T1-01 | Soil | 12 | 1200894 | 3/5/2020 | ND | ND | ND | ND | 0.0007 | No |
| T1-02 | Soil | 12 | 1200894 | 3/5/2020 | ND | ND | ND | 0.00086 | 0.0009 | No |
| T1-03 | Soil | 12 | 1200894 | 3/5/2020 | 0.0039 | 0.0014 | ND | 0.008 | 0.0304 | Yes |
| T1-04 | Soil | 12 | 1200894 | 3/5/2020 | 0.0313 | 0.0131 | 0.0067 | 0.0857 | 0.158 | Yes |
| T1-05 | Soil | 12 | 1200894 | 3/5/2020 | 0.0095 | 0.0136 | 0.0015 | 0.0402 | 0.583 | Yes |
| T1-06 | Soil | 12 | 1200894 | 3/5/2020 | 0.0229 | 0.0567 | 0.0234 | 0.0558 | 0.946 | Yes |
| T1-07 | Soil | 12 | 1200894 | 3/5/2020 | 0.0061 | 0.025 | 0.0056 | 0.0014 | 0.0165 | Yes |
| T1-08 | Soil | 12 | 1200894 | 3/5/2020 | 0.0014 | ND | ND | ND | 0.004 | Yes |
| T1-09 | Soil | 12 | 1200894 | 3/5/2020 | 0.0012 | 0.0024 | ND | 0.0014 | 0.0037 | Yes |
| T1-10 | Soil | 12 | 1200894 | 3/5/2020 | 0.0049 | 0.0107 | 0.0019 | 0.0063 | 0.0203 | Yes |
| T1-11 | Soil | 12 | 1200894 | 3/5/2020 | 0.039 | 0.0659 | 0.0488 | 0.127 | 2.91 | Yes |
| T1-12 | Soil | 12 | 1200894 | 3/5/2020 | 0.0255 | 0.0178 | 0.0132 | 0.0647 | 1.38 | Yes |
| T1-13 | Soil | 12 | 1200894 | 3/5/2020 | 0.04 | 0.0124 | 0.0089 | 0.0691 | 0.745 | Yes |
| T1-14 | Soil | 12 | 1200894 | 3/5/2020 | 0.0267 | 0.0124 | 0.0096 | 0.0631 | 0.423 | Yes |
| T1-15 | Soil | 12 | 1200894 | 3/5/2020 | ND | ND | ND | 0.0034 | 0.0282 | Yes |
| T1-16 | Soil | 12 | 1200894 | 3/5/2020 | 0.0047 | 0.0019 | ND | 0.0067 | 0.0367 | Yes |
| T1-17 | Soil | 12 | 1200894 | 3/5/2020 | 0.017 | 0.0056 | 0.0055 | 0.0319 | 0.19 | Yes |
| T1-18 | Soil | 12 | 1200894 | 3/5/2020 | 0.0248 | 0.008 | 0.0052 | 0.0732 | 0.293 | Yes |
| T1-19 | Soil | 12 | 1200894 | 3/5/2020 | 0.0488 | 0.0269 | 0.0202 | 0.163 | 2 | Yes |
| T1-20 | Soil | 12 | 1200894 | 3/5/2020 | 0.0559 | 0.0273 | 0.0193 | 0.176 | 1.54 | Yes |
| T1-21 | Soil | 12 | 1200894 | 3/5/2020 | 0.0389 | 0.0193 | 0.0147 | 0.107 | 1.59 | Yes |
| T1-22 | Soil | 12 | 1200894 | 3/5/2020 | 0.0684 | 0.0344 | 0.0205 | 0.158 | 1.76 | Yes |
| T1-23 | Soil | 12 | 1200894 | 3/5/2020 | 0.0411 | 0.0138 | 0.0079 | 0.0634 | 0.471 | Yes |
| T1-24 | Soil | 12 | 1200894 | 3/5/2020 | 0.00077 | 0.00042 | ND | 0.00046 | ND | No |
| T1-25 | Soil | 12 | 1200894 | 3/5/2020 | 0.023 | 0.0241 | 0.0231 | 0.126 | 1.12 | Yes |
| T1-26 | Soil | 12 | 1200894 | 3/5/2020 | 0.0284 | 0.0166 | 0.0102 | 0.0932 | 0.78 | Yes |
| T1-27 | Soil | 12 | 1200894 | 3/5/2020 | 0.051 | 0.0407 | 0.0222 | 0.272 | 4.41 | Yes |
| T1-28 | Soil | 12 | 1200894 | 3/5/2020 | 0.0631 | 0.0404 | 0.017 | 0.28 | 2.38 | Yes |
| T1-29 | Soil | 12 | 1200894 | 3/5/2020 | 0.0667 | 0.0344 | 0.0152 | 0.239 | 1.62 | Yes |
| T1-30 | Soil | 12 | 1200894 | 3/5/2020 | 0.0375 | 0.0234 | 0.0122 | 0.212 | 0.93 | Yes |

| Sample Name | Sample Type | Sample Depth (Inches) | Report # | Date Sampled | Perfluoroheptanoic acid (PFHpA) ug/kg | Perfluorooctanoic acid (PFOA)ug/kg | Perfluorononanoic acid (PFNA)ug/kg | Perfluorohexanesulfonic acid (PFHxS)ug/kg | Perfluorooctanesulfonic acid (PFOS)ug/kg | Above DEC Limits for PFOA/PFOS (0.0017/0.003 ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| T1-31 | Soil | 12 | 1200894 | 3/5/2020 | 0.01 | 0.0052 | 0.0038 | 0.0298 | 0.116 | Yes |
| T1-32 | Soil | 12 | 1200894 | 3/5/2020 | ND | ND | ND | 0.06 | 0.0718 | Yes |
| T1-33 | Soil | 12 | 1200894 | 3/5/2020 | ND | ND | ND | 0.0005 | 0.0052 | Yes |
| T1-34 | Soil | 12 | 1200894 | 3/5/2020 | 0.0013 | ND | 0.001 | 0.004 | 0.0542 | Yes |
| T1-35 | Soil | 12 | 1200894 | 3/5/2020 | 0.0067 | 0.0027 | ND | 0.0146 | 0.0409 | Yes |
| T1-36 | Soil | 12 | 1200894 | 3/5/2020 | 0.0094 | 0.0082 | 0.0109 | 0.0377 | 0.177 | Yes |
| T1-37 | Soil | 12 | 1200894 | 3/5/2020 | 0.0214 | 0.0177 | 0.008 | 0.12 | 0.213 | Yes |
| T1-38 | Soil | 12 | 1200894 | 3/5/2020 | 0.0036 | 0.0049 | ND | 0.0224 | 0.853 | Yes |
| T1-39 | Soil | 12 | 1200894 | 3/5/2020 | 0.0146 | 0.032 | 0.0131 | 0.247 | 2.83 | Yes |
| T1-40 | Soil | 12 | 1200894 | 3/5/2020 | ND | 0.132 | ND | 0.95 | 35.9 | Yes |
| T2-01 | Soil | 12 | 1200894 | 3/5/2020 | 0.0022 | 0.0043 | 0.0029 | 0.017 | 0.231 | Yes |
| T2-02 | Soil | 12 | 1200894 | 3/5/2020 | 0.0099 | ND | ND | 0.0032 | 0.017 | Yes |
| T2-03 | Soil | 12 | 1200894 | 3/5/2020 | 0.0016 | 0.0017 | 0.0015 | 0.0136 | 0.152 | Yes |

*Shaded=Above DEC Limits

## Table 2: Surface and Groundwater Results

| Sample Name | Sample Type | Sample Depth (Inches) | Report # | Date Sampled | Perfluoroheptanoic acid (PFHpA) ng/L | Perfluorooctanoic acid (PFOA)ng/L | Perfluorononanoic acid (PFNA)ng/L | Perfluorohexanesulfonic acid (PFHxS)ng/L | Perfluorooctanesulfonic acid (PFOS)ng/L | Above DEC Limits for PFOA/PFOS (0.4 ng/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| Postmark Bog Outlet | Surface Water | 0 | 1215461 | 8/25/2021 | 0.079 | 0.0588 | 0.0147 | 0.0993 | 0.149 | No |
| USPS GW Well | Groundwater | 137 | 1215461 | 8/25/2021 | 0.051 | 0.0264 | 0.0054 | 0.201 | 0.01414 | No |
| SE Postmark Well | Groundwater | 8 | 1215461 | 8/25/2021 | 0.0146 | 0.0049 | 0.0023 | 0.0134 | 0.0164 | No |
| NW ARFF PZMTR WELL | Groundwater | 0-1 | 1215461 | 8/25/2021 | 2.5 | 1.63 | ND | 16.5 | 0.0826 | Yes |
| SW ARFF GW | Groundwater | 0-1 | 1215461 | 8/25/2021 | 0.775 | 0.536 | 0.0653 | 0.749 | 19.5 | Yes |
| NE Postmark Bog Well | Groundwater | 735 | 1215461 | 8/25/2021 | ND | ND | ND | ND | 0.0056 | No |
| 104605 B4 S2 Water | Groundwater | 0-1 | 1200883 | 2/27/2020 | 0.174 | 0.0671 | 0.0032 | 0.119 | 0.0285 | No |
| 104605 B15 S2 | Groundwater | 0-1 | 1200883 | 2/27/2020 | 2.07 | 1.04 | ND | 14.9 | 0.509 | Yes |
| 104605 B20 S2 | Groundwater | 0-1 | 1200883 | 2/27/2020 | 1.36 | 0.207 | 0.0355 | 1.35 | 0.397 | No |
| 104605 B13 | Groundwater | 0-1 | 1200883 | 2/27/2020 | 2.46 | 0.978 | 0.0888 | 7.41 | 3.2 | Yes |

*Shaded=Above DEC Limits

Figure 1: Postmark Bog Vicinity Map

Figure 2: Postmark Bog Area PFAS Soil and Water Results

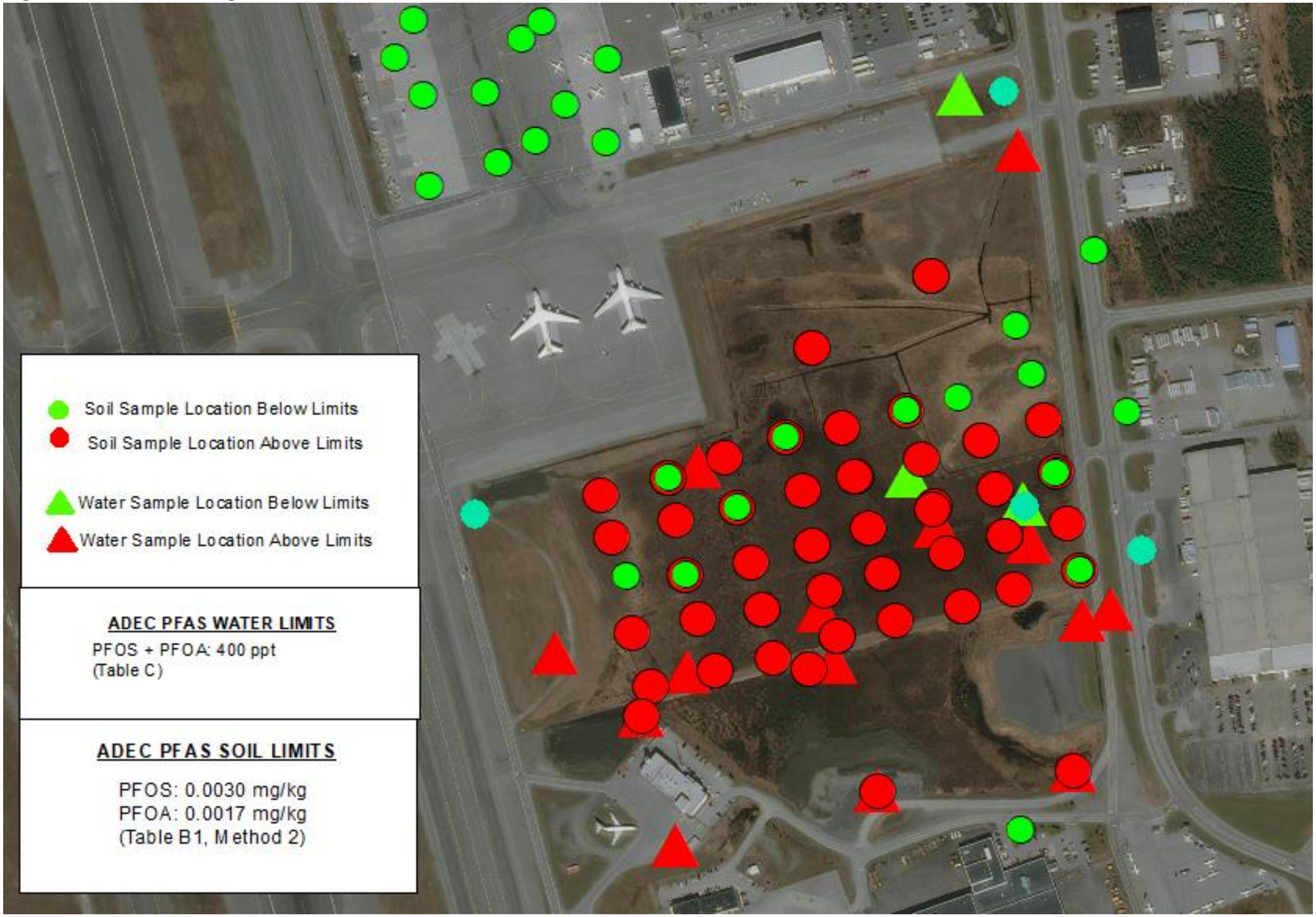

Figure 3: Postmark Bog Groundwater Elevation and Estimated Groundwater Flow Direction

Figure 4: Postmark Bog Snow Storage and Drainage Areas

# APPENDIX B: SITE SECURITY SIGNAGE

# PFAS CONTAMINATED MATERIAL DO NOT DISTURB

**[CONTRACTOR COMPANY NAME]**

**[POC NAME] [POC PHONE #]**

**DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES**

**[POC NAME] [POC PHONE #]**

**GENERATION DATE: MONTH/DATE/YEAR**

## Theresa Dutchuk

| | |
|---|---|
| **From:** | O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov> |
| **Sent:** | Wednesday, December 20, 2023 2:42 PM |
| **To:** | Theresa Dutchuk |
| **Cc:** | Kito, Sam (DEC) |
| **Subject:** | RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan |

Hi Theresa, thank you for addressing my comments. Everything looks good in the plan so far and I don't have any further comments. I'm looking forward to approving the final plan and can work with Sam on the excavation dewatering permit application as needed once that is submitted.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Monday, November 27, 2023 12:25 PM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Cc:** Kito, Sam (DEC) <sam.kito@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

Thank you very much for your review of the ACCS plan. Please see attached for a revised Plan per your comments below. I spoke with the proposed remediation consultant and confirmed adding treatment along the lease lot to cover the entire boundary between ACCS and FedEx was achievable. The Plan has been updated accordingly.

Please let us know if you would like to see anything else!

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1238 | direct
*dowl.com*

---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Wednesday, November 22, 2023 9:19 AM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Cc:** Kito, Sam (DEC) <sam.kito@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Thanks Theresa, I have two comments on the revised plan

1. Section 3.2, first paragraph- Breakthrough calculations are typically performed prior to any water filtration and are used to size the carbon treatment system bases on the contaminant concentrations and volume of water to

be treated. The text in this paragraph has those calculations occurring after the treatment system is designed and onsite, which could cause delays or cost overruns if it was not designed accordingly.

2. Figure 3- The stormwater outlet for the bog is in the NE corner of the FedEx lease and is the area where surface water displaced during the surcharging is likely to migrate. As we discussed there is no treatment proposed for the NE boundary of the ACCS project, potentially allowing PFAS contaminated water to migrate onto the FedEx lease and towards the outlet. To address this concern, please extend the edge sorptive amendment, shown in pink on the figure, along this NE project boundary as well.

Feel free to give me a call if you'd like to discuss my comments.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

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**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, November 10, 2023 11:53 AM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

See attached for an updated document with a new Figure 3: Site Map.

Hope you're staying safe in this snow!

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

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---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Tuesday, October 31, 2023 1:11 PM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Thanks Theresa, at this stage in the process I think I'll need that to approve this next iteration of the CMMP.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Tuesday, October 31, 2023 1:05 PM

**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

Sorry for the delayed response. We don't have any figures yet, but certainly I could have our GIS folks put one together to supplement the Plan.

Let me know what you think,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
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---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Monday, October 23, 2023 10:41 AM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Thanks Theresa, are there any figures yet showing the alignment of the remediation trench?

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Wednesday, October 18, 2023 12:38 PM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

An updated Interim CMMP is attached for your review. We updated the last draft per your comments below.

Please let us know if there are any further questions or comments. A Final CMMP will be prepared as a supplement to the General Excavation Dewatering Permit application.

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1238 | direct
*dowl.com*

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**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Monday, October 9, 2023 3:30 PM

**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

***WARNING:*** *External Sender - use caution when clicking links and opening attachments.*

Hi Theresa, here are my comments on the interim CMMP. Let me know if you want to discuss my comment on water treatment

1. Paragraph below Figure 1- This section should include groundwater, as well as soil and surface water. Completed
2. Paragraph below figure 2- ppt in this context is parts per trillion, or nanograms per liter (ng/l) if you want to stick with metric units. For the purposes of excavation dewatering, we have been applying the 2016 EPA lifetime health advisory level of 70 ppt to design water treatment systems. Completed
3. Section 3.2 describes a process where PFAS contaminated water will be pumped from an excavation and discharged to the remediation trench described in Section 3.1. The goal of the remediation trench is to reduce or eliminate PFAS in water that migrates through the trench during the surcharging process, so if the adsorptive capacity of the carbon in the trench is expended treating water that is discharged directly to the trench, then it loses it's effectiveness at treating water that is passively discharged during surcharging. Additionally, calculating breakthrough for a mix of activated carbon and gravel may be problematic. Please note that petroleum is also present in water at the site in several locations which will also affect the PFAS adsorptive capacity of the carbon. At similar projects, contractors have typically proposed dedicated carbon treatment vessels where the residence time and adsorptive capacity can be better controlled and there can be greater confidence in the breakthrough calculations. If designed based on the breakthrough calculations, then the water can be directly discharged to stormwater following treatment. Please note that active pumping and treatment of contaminated groundwater may also be necessary during installation of the remediation trench itself. Clarified that the active water will be discharged into carbon filter vessels, leaving the trench for the surcharged passive water

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

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**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, October 6, 2023 9:48 AM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** ACCS NEPA Interim Contaminated Materials Management Plan



Good Morning Bill –

Attached for your review is a NEPA Interim Contaminated Materials Management Plan to support the NEPA documentation. A final version will be prepared to support the excavation dewatering permit which will be required for the project. This Plan contains preliminary proposed methods to address PFAS contamination at Postmark Bog during construction.

Please let us know if you approve of this NEPA Interim Contaminated Materials Management Plan or if you have any comments.

Thank you!
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

(907) 562-2000 | office
(907) 865-1238 | direct

*dowl.com*

# APPENDIX C:

# SECTION 106 CONSULTATION

# TABLE OF CONTENTS

In Reply Refer To:
Alaska Cargo and Cold Storage Facility
POA-2021-00121, Knik Arm
Consultation Initiation
May 20, 2022

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565

Dear Ms. Bittner:

Alaska Cargo and Cold Storage, LLC (ACCS) is seeking to construct a cargo and cold storage facility at ANC in order to accommodate existing and future demand for cargo operations, increase operational efficiencies through new and improved cargo and airline support facilities, and meet Federal Aviation Administration (FAA) and airport safety requirements. The construction of the proposed project will require an Airport Layout Plan (ALP) approval from the Alaskan Region Airports Division of the FAA. In accordance with 36 CFR § 800 and FAA guidance, ALP approval is considered by FAA to be an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA). The project is located on the east side of the airport, west of Postmark Drive, and north of the Aircraft Rescue and Fire Fighting Station, within Section 28, Township 13N, Range 4W, Seward Meridian; U.S. Geological Survey (USGS) Quad Anchorage A-8 NW (Figure 1).

On behalf of the FAA, ACCS and DOWL are initiating this consultation with your office to assist the FAA in determining the Area of Potential Effect (APE) and identifying historic properties that may be affected by the proposed project.

**Project Description**

The project lease area is a 29-acre parcel located west of and across the street from the US Post Office on Postmark Drive. Located within the restricted access area of the ANC compound, it is east of the north-south runway and north of the ANC north terminal. A new concrete pad, covering most of the lease area, would be constructed to support a cargo storage and warehouse facility with airside and landside loading areas. Prior to the placement of the pad, the site would be cleared, and overburden would remain on site mostly undisturbed. Major components of the proposed project are:

a. Cargo Warehouse
b. Cold Storage
c. New Aircraft Parking Apron
d. Hardstand Fuel Distribution
e. Ground Support Equipment Shop and Parking

f. Ancillary/Control Space
g. Road Connection to Postmark Dr.

The approximately 136,000 square foot building would have a steel pile foundation and utilities would be buried within the 29-acre lease area.

**Preliminary Area of Potential Effect**
The FAA has defined the preliminary area of potential effects (APE) as the 29-acre lease area for the Anchorage Cargo and Cold Storage Facility (Figure 2). FAA will finalize the APE after comments are received from your office and the consulting parties.

**Identification Efforts**
Information identified to date includes review of the Alaska Heritage Resources Survey (AHRS) database, which revealed that there are no previously documented historic properties or AHRS sites located within the lease area. Historical aerial images showing the development of ANC have been also reviewed to determine changes and modifications to the lease area over time. In addition to the desktop review of data, ACCS plans to have the lease area inventoried by a Professionally Qualified Individual for archaeological survey in May of 2022.

**Consulting Parties**
In addition to your office, the FAA has submitted a copy of this initiation letter to the Native Village of Eklutna, and the Municipality of Anchorage.

If you have questions or comments related to this proposed project, I can be reached by telephone at 907-865-1283, or by e-mail at janders@dowl.com.

Your timely response will greatly assist us in incorporating your concerns into project development. For that purpose, we respectfully request that you respond within thirty days of your receipt of this correspondence.

Sincerely,

Jake Anders, RPA
Cultural Resource Manager

Enclosures:
Figure 1: Project Location and Vicinity
Figure 2: Project APE and Components

Electronic cc w/ enclosures:
**Jack Gilbert, Lead Environmental Protection Specialist, Alaska Regional Office, Federal Aviation Administration**

**Joe Jacobson, Alaska Cargo and Cold Storage, LLC, Proponent**
**Teri Lindseth, DOT&PF, Planning and Development, Ted Stevens Anchorage International Airport, Deputy Airport Director**


Project APE

Airport Property Boundary

N

0 1,800 3,600 Feet

**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage Section 106

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity

Imagery Layer: Maxar, Microsoft


Project APE

Proposed Project

N

0 150 300 Feet

**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage Section 106

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

In Reply Refer To:
Alaska Cargo and Cold Storage Facility
POA-2021-00121, Knik Arm
RevComp #2022-00674
Finding of No Historic Properties Affected
July 19, 2022

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

Dear Ms. Bittner:

Ted Stevens Anchorage International Airport (ANC) together with Alaska Cargo and Cold Storage, LLC (ACCS) is proposing to construct a cargo and cold storage facility at ANC in order to accommodate existing and future demand for cargo operations, increase operational efficiencies through new and improved cargo and airline support facilities, and meet Federal Aviation Administration (FAA) and airport safety requirements (Project). The construction of the proposed project will require an Airport Layout Plan (ALP) approval from the Alaskan Region Airports Division of the FAA. In accordance with 36 CFR § 800 and FAA guidance, ALP approval is considered by FAA to be an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA).

On behalf of the FAA, ACCS and DOWL find that no historic properties would be affected by the proposed project pursuant to 36 CFR 800.4(d)(1), implementing regulations of Section 106 of the NHPA. This submission provides documentation in support of this finding as required at 36 CFR § 800.11(d).

**Project Description**

The Project location is a 29-acre lease area at ANC, on the east side of the airport on North Tug Road. The land parcel is east of the north-south runway, west of Postmark Drive and the US Post Office and north of the ANC north terminal. The area is referred to by the State of Alaska as the Postmark Bog Development Area, just north of the Aircraft Rescue and Fire Fighting Building. It is within Section 28, Township 13 North, Range 4 West, Seward Meridian; U.S. Geological Survey (USGS) Quad Anchorage A-8 NW (Attachment 1). The environment is a wetland marsh with areas of pooling water.

FAA has determined that pre-construction activities associated with the proposed Project (e.g., vegetation clearing, drainage improvements) are a phase of the undertaking, and are therefore subject to Section 106 review. FAA's involvement in and authority over the proposed Project consists solely of reviewing and approving of the final construction designs and as-built surveys to approve the change to the ANC's ALP. Additionally, Appendix E of the ANC 2014 Airport Master Plan Update indicates that if and when the time comes for the Airport to consider implementation of a project recommended in the Master Plan Update, Section 106 of the NHPA is to be adhered to. The Postmark Bog Development Area is recommended for taxilane enhancement and parking in the plan (RS&H 2014).

A new concrete pad, covering most of the lease area, would be constructed to support a cargo storage and warehouse facility with airside and landside loading areas. Prior to the placement of the pad, the site would be cleared, and overburden would remain on site mostly undisturbed. Major components of the proposed project are:

1. Cargo Warehouse
2. Cold Storage
3. New Aircraft Parking Apron
4. Hardstand Fuel Distribution
5. Ground Support Equipment Shop and Parking
6. Ancillary/Control Space
7. Road Connection to Postmark Dr.

The approximately 136,000 square foot building would have a steel pile foundation and utilities would be buried within the 29-acre lease area.

**Area of Potential Effects**

The FAA has defined the Area of Potential Effects (APE) as the 29-acre lease area for the Anchorage Cargo and Cold Storage Facility (Attachment 1). The area is an open parcel without access restriction. Numerous buried utility lines cross the lease area and evidence of past ground disturbance can be seen in the western portion of the parcel.

**Identification Efforts**

DOWL cultural resources staff, Jake Anders and Amy Ramirez, conducted the background research and field survey for this assessment. Mr. Anders meets the Secretary of the Interior's Professional Standards for Archaeology and Ms. Ramirez meets the Secretary of the Interior's Professional Standards for Architectural History (48 Federal Register [FR] 44738-9, September 29, 1983).

*Literature Review, Archival Research, and Desktop Survey*

DOWL's desktop research and assessment methods followed the guidance provided in the Alaska Department of Natural Resources, Office of History and Archaeology (OHA) Preservation Series Number 8, *Review and Compliance Guidelines,* and Number 11, *Cultural Resources Investigations and Report Outline* (Alaska Office of History and Archaeology 2018, 2019). The identification effort consisted of a desktop records review of sources of archaeological, historic, and ethnographic cultural resource data. In addition, DOWL has incorporated a review of historic aerial imagery and remotely-sensed data to assess the degree of previous development activities and disturbance and to identify high-potential landforms for archaeological properties. The inventory  included agency and consulting party outreach, archival and database research, and reviews of previous literature and reports concerning the history of ANC and FAA's presence in Alaska and Anchorage. Sources DOWL consulted include the Alaska Heritage Resources Survey (AHRS) in the OHA's Integrated Business Suite

(IBS) database for recorded resources in and near the proposed APE. The National Register of Historic Places (NRHP) and National Historic Landmarks databases maintained by the National Park Service (NPS) were also reviewed.

DOWL reviewed the IBS at OHA to determine the extent of previous cultural resource work in the area. The purpose of the file search was to identify any previous cultural resources studies, and documented AHRS historic buildings, sites, structures, objects, or districts located within or near the property. In addition, reports and documentation not readily available on file at OHA were obtained from digital libraries and online archives and reviewed for relevance to the project. The purpose of the review and documentation was to ascertain changes and modifications to the lease area over time.

To identify areas of potential historic use and assess previous disturbance within the APE, DOWL obtained and reviewed historic aerial photographs of the area. Aerial photographs reviewed are accessible via the USGS, and provide coverage of the area for the years 1950, 1953, 1962, 1964, 1972, 1984, and 1988 (USGS 2022). The ANC 2014 Master Plan Update, Chapter 2, Section 2, "Historic Context and Background of the Airport" was also reviewed for information regarding the history of aviation in Anchorage and the global events that shaped the evolution of the ANC through time (RS&H 2014). Historic aerial images contained within the plan from 1950, 1970, 1982, and 2012 were used to compliment the reviewed USGS imagery data. Additionally, the Alaska Department of Transportation and Public Facilities (DOT&PF) maintains a website for ANC that includes a timeline of notable events at the airport and in Alaska aviation, and was used to draft a historic context for the APE (Alaska Department of Transportation and Public Facilities 2022).

The reviewed data was synthesized to assess the potential for historic properties to be present within the APE and to create a historic context directly related to the property. The combined data synthesis and historic context were used to guide the field survey in the APE.

*Field Survey*

DOWL's field survey was guided by the *Secretary of the Interior's Standards and Guidelines for Historic Preservation*, the National Park Service's National *Register Bulletin #24 – Guidelines for Local Surveys: A Basis for Preservation Planning* (1985), and the OHA's Preservation Series Number 11, *Cultural Resources Investigations and Report Outline* (2019) and Number 12, *Archaeological Research Designs* (2019).

DOWL completed a pedestrian archaeological and historic resources survey across the entire APE on June 20, 2022. The parcel is water-saturated and has been disturbed in several locations and has been used by ANC for multiple decades and was therefore considered low potential for containing intact archaeological or historic resources.

Prior to field investigation, DOWL obtained an ANC Building Permit for ground surface inspection, and an Alaska State Cultural Resources Investigation Permit (SCRIP) from the Alaska OHA. ANC Building Permit 22-048 was issued with Special Conditions that included no excavation of soil within the site or lease area without first receiving Alaska Department of Environmental Conservation (DEC) approval of an excavation, handling, and reuse/disposal plan. The Alaska DEC has identified polyfluoroalkyl substances (PFAS, PFOS, and PFOA) and petroleum hydrocarbons (DRO and RRO) at the Anchorage Internal Airport Aircraft Rescue and Fire Fighting Building Site that has an expanded plume stretching across the entire Postmark Bog Development area (Department of Environmental Conservation 2022).

All field research adhered to the provisions of SCRIP# 2022-39. DOWL's pedestrian survey was executed using 15-meter east-west transects, starting at the south edge of the APE, with detailed inspection of the ground's surface for identification of possible cultural anomalies. Special attention was given to areas of previous disturbance to identify possible activities resulting in the ground disturbance. The area was photo documented and GPS waypoints collected for any possible cultural finds (Attachment 2: Photographs).

Due to the site disturbance and prior use, ANC Building Permit Special Conditions and soil contamination, and the presence of buried utility lines across the land parcel, no subsurface testing was undertaken.

**Results**

*Historic Context*

Human occupation in the area of ANC can be traced back to at least 1,500 BP and is attributed to the Athabascan-speaking Dena'ina of the Upper Cook Inlet dialect (Stone 2008; Grover 2009; Fall 1981). Early Euro-American explorers who entered Cook Inlet documented coastal fish camps and seasonal settlements at freshwater outflows along both sides of the Knik Arm. The area has many Dena'ina place names and locations of former fish camps, including one at Point Woronzof (Nuch'ishtunt) just west of the ANC property. The tidal flats between the point and Fire Island are thought to have been used to trap marine mammals and fish during extreme tidal swings (Grover 2009).

The Point Woronzof site (AHRS # TYO-00030) is a Dena'ina settlement that has been well documented in both the ethnographic and historic record. The site was first chronicled in 1932 by Frederica de'Laguna (Mobley 1993). Dena'ina life was completely structured around seasonal subsistence, with gathered foods stored during the winter in subterranean cache pits (Stone 2008). Much of the archaeological evidence of Dena'ina settlements in Anchorage has been destroyed or lost beneath the development of the city. A determinate displacement of the Dena'ina in the Anchorage bowl occurred during World War II, when settlements along Chester Creek at Westchester Lagoon were lost to urban growth, and a ban on fishing from Point Woronzof was implemented (Grover 2009; Kari et al. 2003).

Euro-American settlement in Anchorage gained a foothold in 1915 when the US Government established a railroad construction camp at Fish Creek to complete a rail line between Seward and Anchorage (Atwood and Radcliffe 1982). The camp quickly grew with the addition of miners and trappers who came for employment, and merchants who suppled provisions to the camp occupants. Population growth, construction, and development of infrastructure was steady (Meinhardt and Ramirez 2012). Largely centered around the current downtown area, most of the land around ANC was undeveloped and part of the Chugach National Forest Reserve. In 1916, a road was cut through the reserve by Joe Spenard to lakes Hood and Spenard, the location of the present-day Lake Hood Seaplane Base. Development along the new road began slowly in the late 1920s due to its remoteness, yet driven by the limited number of housing units and high costs of homeownership in the core of Anchorage. The first homestead patent issued under the Homesteading Act of 1862 was received in 1936 by Peter Ericson for 280 acres near Sand Lake (Grade Six Students 1988).

As early as 1923, it became apparent that suitable aviation facilities would become a necessity for the geographically isolated city. Airstrips were constructed near the city center and outside of town to the north, and a seaplane base was added south of the city (Faith, Yarborough, and

Pendleton 2005). The seaplane base became the world's busiest seaplane base by 1951 and in 1955 an air traffic control tower was raised (Carlson, Kennedy, and Cernick 1981; Carberry 1979).

The construction of ANC was initially funded by US Congress in 1946 through the Federal Airport Act, which designated the Civil Aeronautics Administration (CAA) the authority to develop two international airports in Alaska; one in Anchorage and one in Fairbanks (Ramirez et al. 2016). That same year, three new global air transport routes were selected to converge in Anchorage, following the curvature of the earth and shortening flight times across the northern hemisphere. In 1948, US Congress authorized funding for the purchase of land, issuance of contracts for design and construction, and for full operation of the new international airport near Anchorage. The area west and south of Lake Hood was selected and Spenard Road became the primary access route. Construction began in 1949 and the airstrip at ANC was operational by 1950. The first terminal was completed in 1953 (Alaska Department of Transportation and Public Facilities 2022). During this period and into the Cold War, the military also utilized land within what is now ANC property. In 1955, the National Guard moved to the new Kulis Air National Guard Base. The 77-acre complex was located just south of the current north-south runway at ANC and had a large hangar, supply buildings, a taxiway, and aircraft parking (Nowick 2007).

Alaska became the 49th US state in 1959, a year when many holdings of the federal government, including the Anchorage International Airport, were transferred to the State of Alaska (Alaska Department of Transportation and Public Facilities 2022). Through the 1960s, traffic and aircraft size steadily increased, requiring larger, re-engineered runways. Seven international air carriers used ANC as a stop-over route between Europe, Asian, and the eastern US. The 1964 Good Friday earthquake, 9.2 in magnitude, destroyed the airport control tower. Control was transferred to the tower at Lake Hood seaplane base and a supplemental tower was installed and used for twelve years, until a permanent tower was constructed in 1977. The Lake Hood tower was decommissioned once the new ANC tower was functional (Alaska Department of Transportation and Public Facilities 2022).

The 1978 Airline Deregulation Act relaxed federal control on the domestic airline industry, spurring even more growth in passenger travel and industry consolidation. When oil prices began to decline in the 1980s, State of Alaska budgets were cut and domestic traffic at ANC dropped. International travel also declined in 1989 after Russian airspace was opened, allowing for alternative routes for long-haul flights, but both FedEx and the US Postal Service used the trans-Pacific routes to their benefit and opened massive sorting centers at the airport (Alaska Department of Transportation and Public Facilities 2022). ANC underwent a large renovation in 1999, and in 2000 the Anchorage International Airport was renamed in honor of US Senator Ted Stevens. A new C Concourse terminal building, 4636,000 square feet, was completed in 2004 and extends north towards the current Project lease area.

### *Literature Review*

A review of the AHRS on April 27, 2022 indicated that no cultural resources surveys have been completed within the APE (Alaska Office of History and Archaeology 2022), nor does the APE contain previously documented historic properties or AHRS resources. The review area was then expanded to one mile beyond the APE to gain a better understanding of the types of past investigations and documented resources in the vicinity.

Twenty-one previous cultural resources investigations have been completed within one mile of the APE (Attachment 3). The investigations were primarily completed for compliance with state and federal regulations and include trail maintenance and transmission studies at Point Woronzof and facilities upgrades at Lake Hood and ANC. Two historic contexts for the area and documentation of two historic aircraft at the Alaska Aviation Museum were also completed.

### *Previously Recorded AHRS Sites*

There are no previously documented AHRS sites located in the APE. The one-mile expanded search area contains 41 previously documented AHRS resources that are buildings (36), sites (2), objects (3), and a historic district (Attachment 4). None of the resources are currently listed in the NRHP (National Park Service 2022). Determinations of eligibility (DOEs) have been completed for 39 of the resources; two were found to be individually eligible, 19 contribute to the historic district, one was determined not eligible, and 17 are non-contributing to the historic district. Five AHRS resources have not received a DOE, however two of them have been reviewed by the Alaska Historical Commission (AHC) and were recommended not eligible (Alaska Office of History and Archaeology 2022).

The Lake Hood Seaplane Base Historic District (ANC-03003) has been determined eligible for listing in the NRHP by the Alaska State Historic Preservation Office (SHPO) and DOT&PF under Criterion A and is significant for its contribution to the development of Anchorage and the tourist trade, and for providing support services for a growing flying community in the state (Faith, Yarborough, and Pendleton 2005). The district is also eligible under Criterion C, for the distinctive equipment shacks that dot the shores of the seaplane base and their associated tie-downs, which are a purposeful design implemented by DOT&PF,. There are 19 resources within the one-mile search area that contribute to the Lake Hood Seaplane Base Historic District and one individually eligible resource (Lake Hood Seaplane Base, ANC-03287).

### *Indigenous Place Names Review*

DOWL consulted *Shem Pete's Alaska: The Territory of the Upper Cook Inlet Dena'ina* to determine if known/recorded Dena'ina place names existed within the vicinity of the proposed Project APE (Kari and Fall 2003). While there are names recorded for features in the general vicinity of the APE (e.g., Lake Hood and Lake Spenard, Fish and Hood creeks, Point Woronzof), there are no place names located within the proposed Project APE.

### *Historic Aerial Photos and Light Detecting and Ranging (LiDAR) and Terrain Data*

To identify areas of potential historic use and assess previous disturbance in the proposed Project APE, DOWL obtained and reviewed historic aerial photographs of the APE. Aerial photographs reviewed by DOWL are accessible via publicly-available sources, and provide coverage of the APE for the years 1950, 1953, 1962, 1964, 1972, 1984, and 1988. In addition to historic imagery, DOWL consulted publicly-available LiDAR and terrain data[1] to locate areas of previous disturbance (e.g., roads, borrow pits) within the APE which may not be readily apparent in aerial photographs and to identify any geographic features (e.g., active or relict stream terraces, prominent overlooks with expansive vistas) which may be considered to have a high-potential for containing archaeological properties and/or features.

[1] State of Alaska Division of Geological and Geophysical Survey Elevation Portal: https://elevation.alaska.gov/

*Field Survey*

DOWL conducted pedestrian survey of the APE on June 20, 2022. No subsurface testing was completed due to known soil contamination. The west edge of the APE was observed to be slightly elevated with evidence of past disturbance (Photo 1). Vegetation across the APE was primarily low-lying with scrub willow, swamp cotton, and sundew in a floating bog environment (Photos 2–3). Pooling water was observed in some locations within the APE (Photo 4). Areas along the edges of the APE had vegetation that included Labrador tea, spruce, bog myrtle, roses, fireweed, Indian paintbrush, dogwood, and valerian (Photos 5–8).

Views from the center of the APE demonstrate the past and ongoing disturbance of the area through construction and modification of airport and adjacent properties. The US Postal Service hub is visible to the east (Photo 9), while the ANC north-south runway and FedEx shipping facility are in view to the northwest (Photo 10). South of the APE lie the main airport and support buildings, of which the airport maintenance facility and the air traffic control tower are in clear view (Photo 11). No cultural resources were observed during the survey.

**Consultation Efforts**

ACCS and DOWL assisted the FAA with their consolation and coordination obligations under Section 106 of the NHPA. Initiation letters for the project were sent out to consulting parties on May 5, 2022. Parties included:

- Municipality of Anchorage (Historic Preservation Commission)
- Native Village of Eklutna

The Municipality of Anchorage responded with a request for the DOWL team to attend the June 23, 2022, Historic Preservation Commission meeting. Anders and Ramirez attended the virtual event and presented the project specifications and discussed concerns regarding cultural resources with the Commission. The Commission agreed that the APE had a low probability of containing cultural resources and that the project would not affect historic properties. Several members had questions about the project that were not related to cultural resources, such as wetland impacts and hazardous materials remediation, that DOWL passed along to the project team for accurate responses. The answers to all questions were delivered to the Commission via email on July 12, 2022.

**Section 106 Recommendations**

Based on the results of the identification and evaluation efforts described above, and consistent with 36 CFR § 800.4(d)(1), the FAA has determined that a finding of **No Historic Properties Affected** is appropriate for the proposed undertaking, and is seeking concurrence on this determination from your office.

Your timely response will greatly assist us in incorporating your concerns into project development. For that purpose, we respectfully request that you respond within thirty days of your receipt of this correspondence. Please direct your concurrence or comments to me at janders@dowl.com.

Sincerely,

Jake Anders, RPA, Cultural Resource Manager
DOWL

Attachment(s):
Attachment 1: Figures
Attachment 2: Photographs
Attachment 3: Table of Previous Cultural Resources Investigations within One Mile of APE
Attachment 4: Table of AHRS Resources within One Mile of APE
Attachment 5: Alaska OHA Report Coversheet

Electronic cc w/ Attachments:
**Kristi Ponozzo, Environmental Protection Specialist**
**Jack Gilbert, Lead Environmental Protection Specialist, Alaska Regional Office, Federal Aviation Administration**
**Joe Jacobson, Alaska Cargo and Cold Storage, LLC, Proponent**
**Teri Lindseth, DOT&PF, Planning and Development, Ted Stevens Anchorage International Airport, Deputy Airport Director**

## References

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## Attachment 1: Figures


Project APE

Airport Property Boundary

N

Feet
0 1,800 3,600

**PROJECT LOCATION & VICINITY**

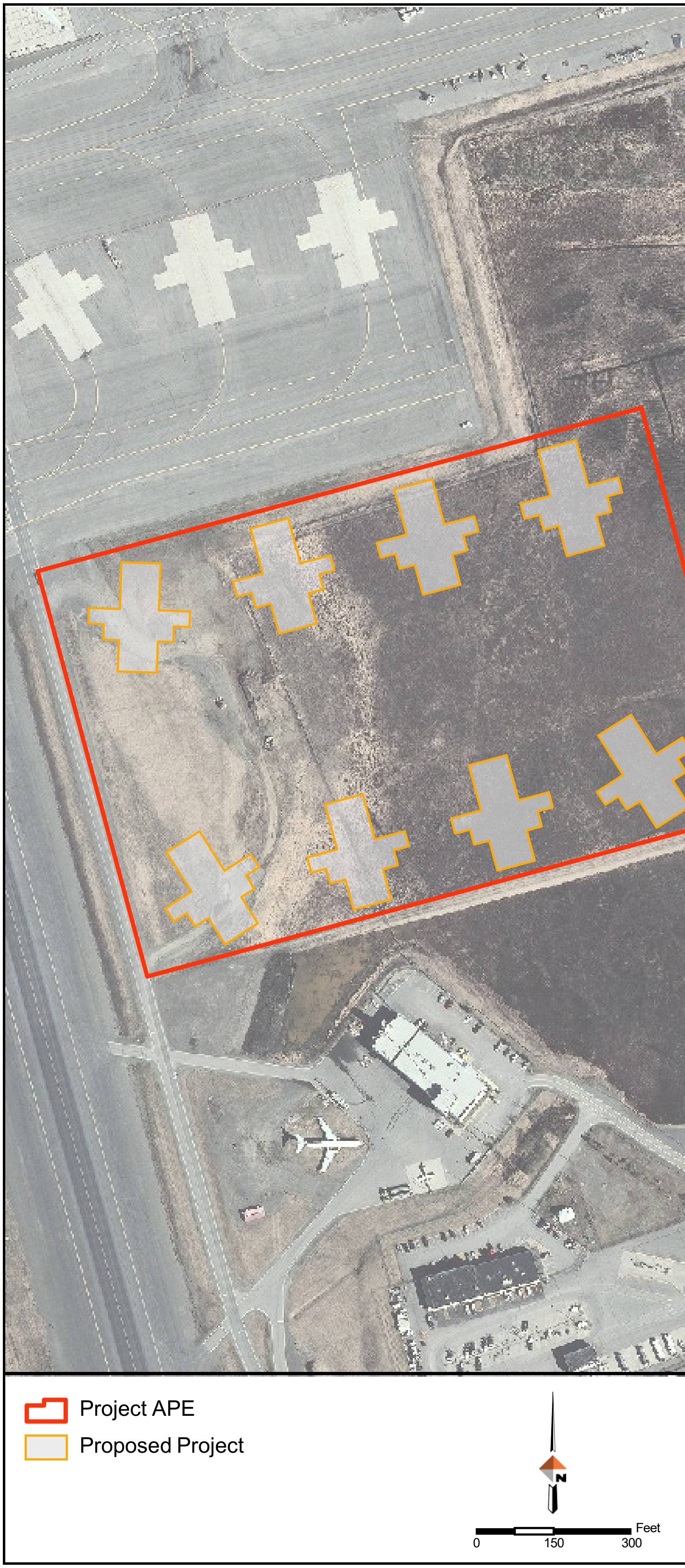
Alaska Cargo and Cold Storage Section 106

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft




**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage Section 106

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

## Attachment 2: Photographs

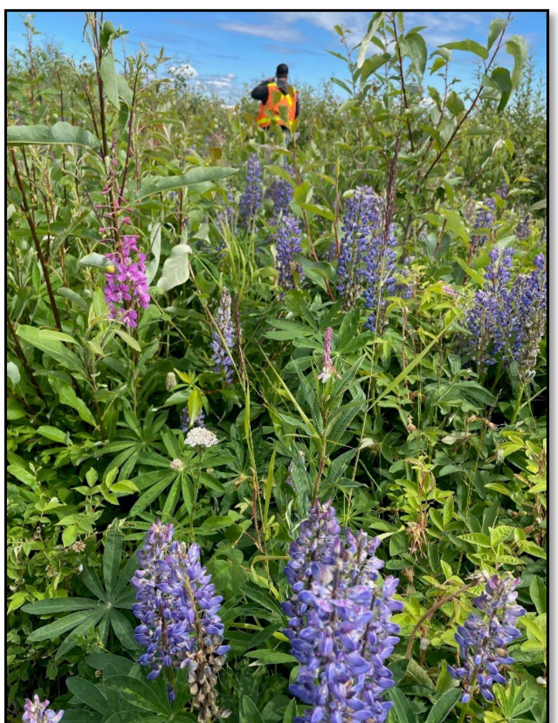
**Photograph 1:** Disturbed, elevated area at the west end of the APE.

**Photograph 2:** Swamp cotton in APE.

**Photograph 3:** Sundew in APE.

**Photograph 4:** Groundwater immediately below ground surface.

**Photograph 5:** Bogbean in APE.



**Photograph 6:** Fireweed and Lupine in APE.

**Photograph 7:** Valerian in APE.

**Photograph 8:** Indian paintbrush in APE.

**Photograph 9:** View to the East from the center of the APE. Note: US Post Office in view.

**Photograph 10:** View to the northwest from the center of the APE. Note: ANC north-south runway and FedEx processing facility in view.

**Photograph 11:** View to the south from the center of the APE. Note: ANC Aircraft Rescue and Fire Fighting Building. and air traffic control tower in view.

## Attachment 3: Table of Previous Cultural Resources Investigations within One Mile of APE

| Record ID | Document Name | Reference |
|---|---|---|
| 16246106 | Original Site Card, ANC-001, Earthquake Park | Hannable 1971 |
| 16237749 | Archeological Survey Along the Proposed Tesoro Gas Pipeline Route Point Campbell to the Tesoro Terminal Portion | Reger 1975 |
| 16479126 | History of Sand Lake | Grade Six students, Sand Lake Elementary and Chinook Elementary Gifted Class 1988 |
| 4347 | Letter Report Re: Anchorage Area-Wide Trails Rehabilitation Work Order # 636602. | Mitchell 2002 |
| 2855 | Letter Report Re: A SWPPP for a Parking Lot on Rockwell Dr, Anchorage | Brock 2004 |
| 4437 | Letter Report Re Demolition of Point Woronzof FAA Station, Anchorage, AK | McConnell 2005 |
| 5748 | Letter Report Re: Historic Properties Guidance. Construction Of Storm Water Pollution Prevention, Ted Stevens Anchorage International Airport UPS Ramp Expansion Project, Anchorage, Alaska | Mormilo 2005 |
| 5751 | Letter Report Re: Historic Properties Guidance. Construction Of Storm Water Pollution Prevention, Ted Stevens Anchorage International Airport Parking Garage Project, Anchorage | Chmielowski 2005 |
| 5799 | Letter Report Re: Echo Parking Phase II, SHPO Clearance | Egbejimba 2005 |
| 8015 | Letter Re Taxiway U Reconstruction, Ted Stevens International Airport | Egbejimba 2005 |
| 8130 | Letter Re Construction Storm Water Pollution Prevention Plan for the N4 and N6 Reconstruction in the North Terminal of the Ted Stevens Anchorage International Airport | Knowles 2006 |
| 8234 | Letter Re Storm Water Pollution Prevention Plan in Support of the Penair Hangar and Office Expansion | Keller 2006 |
| 8302 | Letter Re Storm Water Pollution Prevention Plan for an Expansion of Automobile Parking at The Alaska Cargoport Facility | Plummer 2006 |
| 8480 | Letter Re Anchorage Area-Wide Trails Rehabilitation of Coastal Trail, Chester Creek Trail, Campbell Creek Trail, and Fish Creek Trail Systems | Diller 2006 |
| 16049720 | Taking the Trail Home: Settlement Patterns of the K'enaht'ana Dena'ina and Forgotten Knowledge | Stone 2008 |
| 16006922 | Recommendations of Significance Lake Hood Seaplane Base, Anchorage, Alaska | Faith 2009 |
| 9846 | Ted Stevens Anchorage International Airport Runway 7R Extension Project Cultural Resource Survey Compliance Report | Grover 2009 |
| 16006907 | Historical Review for the Lake Hood Bank Stabilization Project (No. 50920), Anchorage, Alaska | Yarborough et al 2010 |

| Record ID | Document Name | Reference |
|---|---|---|
| 16616727 | Proposed Demolition and Replacement of the Old OAS Hangar, Lake Hood, Anchorage, Alaska | Yarborough et al 2020 |
| N/A | AHRS Number ANC-04591 1966 Helio Courier | Unknown 2021 |
| N/A | AHRS Number ANC-04592 1928 Stearman C2B | Unknown 2021 |

## Attachment 4: Table of AHRS Resources within One Mile of APE

| AHRS No. | Site Name | DOE Status | NRHP Status |
|---|---|---|---|
| ANC-03012 | 3950-4350 Lakeshore Drive | DXS | None |
| ANC-03013 | 5001 Lakeshore Drive | DXS | None |
| ANC-03014 | Lake Hood Airstrip | DXS | None |
| ANC-03016 | 3961 Floatplane Avenue | DXS | None |
| ANC-03018 | 4111 Floatplane Avenue | DXS | None |
| ANC-03019 | 4131 Floatplane Avenue | DXS | None |
| ANC-03020 | 4200 Floatplane Avenue | DXS | None |
| ANC-03021 | 4201 Floatplane Avenue | DXS | None |
| ANC-03022 | 4220 Floatplane Avenue | DXS | None |
| ANC-03029 | 3811 Aircraft Drive | DXS | None |
| ANC-03033 | 3901 Lakeshore Taxiway | DXS | None |
| ANC-03035 | 4125 Aircraft Drive | DXS | None |
| ANC-03038 | 4501 Aircraft Drive | DXS | None |
| ANC-03041 | 4800 Aircraft Drive | DXS | None |
| ANC-03045 | 4519 Enstrom Circle | DXS | None |
| ANC-03017 | 4101 Floatplane Avenue | DXS | None |
| ANC-03003 | Lake Hood Seaplane Base Historic District | DOE-S | None |
| ANC-03287 | Lake Hood Seaplane Base | DOE-S | None |
| TYO-00103 | TYO-00103 | DREJ-S | None |
| ANC-03015 | 3941 Floatplane Avenue | NCP | None |
| ANC-03023 | 4261 Floatplane Avenue | NCP | None |
| ANC-03024 | 4261 Floatplane Avenue | NCP | None |
| ANC-03025 | 3625 Aircraft Drive | NCP | None |
| ANC-03027 | 3665 Aircraft Drive | NCP | None |
| ANC-03028 | 3700A Aircraft Drive | NCP | None |
| ANC-03030 | 3831A Aircraft Drive | NCP | None |
| ANC-03031 | 3813B Aircraft Drive | NCP | None |
| ANC-03032 | 3850 Aircraft Drive | NCP | None |
| ANC-03034 | OAS Secondary Hangar | NCP | None |
| ANC-03036 | 4235 Aircraft Drive | NCP | None |
| ANC-03037 | 4451 Aircraft Drive | NCP | None |
| ANC-03039 | 4701 Aircraft Drive | NCP | None |
| ANC-03040 | 4721 Aircraft Drive (Alaska Aviation Museum) | NCP | None |
| ANC-03046 | 4525 Enstrom Circle | NCP | None |
| ANC-03047 | 4525 Enstrom Circle | NCP | None |
| ANC-03026 | 3650 Aircraft Drive | NCP | None |
| ANC-00001 | Earthquake Park | None | NREJ-C |

| **AHRS No.** | **Site Name** | **DOE Status** | **NRHP Status** |
|---|---|---|---|
| ANC-00122 | GRUMMAN J2F-6 (OA-12) DUCK | None | NREJ-C |
| ANC-04591 | 1966 H-295 Helio Courier | None | None |
| ANC-04592 | 1928 Stearman C2B | None | None |
| ANC-04711 | Ted Stevens International Airport Air Traffic Control Tower and Terminal Radar Approach Control Facility | None | None |

NREJ-C: Found Not Eligible by the AHC; DOE-S: Determined Eligible by SHPO and the Agency; DXS: Contributing Property Within an Eligible District; NCP: Noncontributing Property Within a District; DREJ-S: Determined Not Eligible by SHPO

## Attachment 5: Alaska OHA Report Coversheet

# CULTURAL RESOURCES REPORT COVERSHEET

Must Accompany All Reports Submitted To OHA/SHPO

**Alaska Department of Natural Resources, Office of History and Archaeology**
550 W. 7th Ave., Suite 1310 Anchorage, AK 99501-3565
Phone: (907) 269-8718; Fax (907) 269-8908
http://www.dnr.state.ak.us/parks/oha/index.htm

ID:

Reset Form

1. Date Submitted: **7/19/2022**
2. Project Number:

4. Project Name: Alaska Cargo and Cold Storage Facility

5. Report Title: Alaska Cargo and Cold Storage Cultural Resources Inventory

6. Report Authors: Jake Anders, Amy Ramirez, Caity Kennedy

7. Submitting Organization/Agency: DOWL/Alaska Cargo and Cold Storage

8. Organization/Agency Prepared For: Federal Aviation Administration

9. Principal Investigator(s): Jake Anders, MA

10. Type of Investigation: Survey

11. Sites found/revisited: ☐ Yes ☒ No

11. List New AHRS Site #: N/A

12. List Updated AHRS Site #: N/A

1. Brief Description of the Project Area: 29-acre lease area at Ted Stevens Anchorage International Airport, east of the north-south runway, west of Postmark Drive and the US Post Office and north of the ANC north terminal.

2. USGS Map Sheet(s): Anchorage A-8 NW

3. MTRS (ex. C41S67E23): S13N4W28

4. Land Owner(s): DOT&PF

5. Acres Surveyed: 29

## C. Cultural Resources Management Questions

| | Yes | No |
|---|---|---|
| 1. Is the report part of a National Historic Preservation Act - Section 106 Consultation? | ☒ | ☐ |
| 2. Is the report part of an Alaska Historic Preservation Act Compliance Consultation? | ☒ | ☐ |
| 3. Does the report's data support the submitting agency's determination of eligibility? | ☒ | ☐ |
| 4. Does the report's data support the submitting agency's determination of effect? | ☒ | ☐ |
| 5. Was this report submitted to fulfill State Field Archaeology Permit Requirements<br>If yes, please provide the Permit #: 2022-39 | ☒ | ☐ |
| 6. Was this project and/or report overseen or authored by someone meeting the minimum qualifications of the Secretary of the Interior Standards and Guidelines (48 FR 44738-44739)? | ☐ | ☒ |
| 7. Is the Principal Investigator's resume appended to the report or on file at OHA? | ☒ | ☐ |

8. Additional Comments:

## Amy Ramirez

**From:** Ortiz, Liz M (DNR) <liz.ortiz@alaska.gov>
**Sent:** Friday, August 5, 2022 2:57 PM
**To:** Amy Ramirez
**Cc:** Jake Anders; Theresa Dutchuk; jack.gilbertsen@faa.gov; jjacobson@mckinley-alaska.com; Teri Lindseth; Kristi.M.Ponozzo@faa.gov; Rollins, Mark W (DOT); Hilsinger, Erik D (DOT); Price, Kathy E (DOT); Ortiz, Liz M (DNR)
**Subject:** RE: [EXT] RE: Consultation For the Alaska Cargo and Cold Storage Project at Ted Stevens Anchorage International Airport - Request for Concurrence (RevComp #2002-00674)

**Categories:** Filed by Newforma

3130-1R FAA / 2022-00674

Good afternoon Amy,

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated July 19, 2022), concerning the subject project on July 19, 2022. Following our review of the documentation provided, we concur with the finding of No Historic Properties Affected for the project as proposed. Please note that our office may need to re-evaluate our concurrence if changes are made to the project's scope or design.

As stipulated in 36 CFR 800.3, other consulting parties such as the local government and Tribes are required to be notified of the undertaking. Additional information provided by the local government, Tribes, or other consulting parties may cause our office to re-evaluate our comments and recommendations. Please note that our response does not end the 30-day review period provided to other consulting parties.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4), in consultation with our office. Please note that some sites can be deeply buried or underwater, and that fossils are considered cultural resources subject to the Alaska Historic Preservation Act.

This email serves as our office's official correspondence for the purposes of Section 106. Thank you for the opportunity to review and comment, and thank you for taking our comments into consideration. Please contact Liz Ortiz at 269-8722 or liz.ortiz@alaska.gov if you have any questions or we can be of further assistance.

Thanks,
Liz

Liz Ortiz, M.A. Archaeologist II
Review and Compliance
Alaska State Historic Preservation Office
Office of History and Archaeology
Department of Natural Resources
550 W. 7th Ave, Suite 1310, Anchorage AK, 99501
(907) 269-8722 liz.ortiz@alaska.gov
Due to Covid-19 concerns, we are on a hybrid schedule. Email is the best communication method.

---

**From:** Amy Ramirez <aramirez@dowl.com>
**Sent:** Tuesday, July 19, 2022 10:24 AM
**To:** Ortiz, Liz M (DNR) <liz.ortiz@alaska.gov>
**Cc:** Jake Anders <janders@dowl.com>; Dutchuk, Theresa (DOT sponsored) <tdutchuk@dowl.com>;

jack.gilbertsen@faa.gov; jjacobson@mckinley-alaska.com; Lindseth, Teri D (DOT) <teri.lindseth@alaska.gov>; Kristi.M.Ponozzo@faa.gov; DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>
**Subject:** RE: [EXT] RE: Consultation For the Alaska Cargo and Cold Storage Project at Ted Stevens Anchorage International Airport - Request for Concurrence (RevComp #2002-00674)

The Federal Aviation Administration, with assistance from DOWL and Alaska Cargo and Cold Storage, LLC, is submitting this Section 106 Findings Letter for the proposed Alaska Cargo and Cold Storage Project at Ted Stevens Anchorage International Airport. The FAA has determined that a finding of No Historic Properties
Affected is appropriate for the proposed undertaking, and is seeking concurrence on this determination from your office.

The attached initiation letter PDF contains:

- A description of the project,
- A description of the FAA's undertaking,
- A defined area of potential effects,
- A description of all methods used for identification,
- The results of the identification efforts,
- A finding of no historic properties affected, and
- Two map figures.

Please let me know if you have any issues with the attached PDF file, or if you have any questions or concerns regarding the information presented therein.

Thank you for your attention, and we look forward your response.

Sincerely,

**Amy Ramirez**
Cultural Resource Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1164 | direct
*dowl.com*

**From:** DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>
**Sent:** Wednesday, May 25, 2022 3:21 PM
**To:** Amy Ramirez <aramirez@dowl.com>; DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>
**Cc:** Jake Anders <janders@dowl.com>; Theresa Dutchuk <tdutchuk@dowl.com>; jack.gilbertsen@faa.gov; jjacobson@mckinley-alaska.com; Teri Lindseth <teri.lindseth@alaska.gov>
**Subject:** [EXT] RE: Consultation Initiation For the Alaska Cargo and Cold Storage Project at Ted Stevens Anchorage International Airport

*External Sender - use caution when clicking links and opening attachments.*

Good afternoon,

The Office of History and Archaeology/Alaska State Historic Preservation Office received your documentation, and its review has been logged in with Liz Ortiz under 2022-00674. Our office has 30 calendar days after receipt to complete our review and may contact you if we require additional information. Please contact the project reviewer or me by email if you have any questions or concerns.

Best,
Sarah

Sarah Meitl
Review and Compliance Coordinator
Alaska State Historic Preservation Office
Office of History and Archaeology
907-269-8720

---

**From:** Amy Ramirez <aramirez@dowl.com>
**Sent:** Friday, May 20, 2022 9:40 AM
**To:** DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>
**Cc:** Jake Anders <janders@dowl.com>; Dutchuk, Theresa (DOT sponsored) <tdutchuk@dowl.com>; jack.gilbertsen@faa.gov; jjacobson@mckinley-alaska.com; Lindseth, Teri D (DOT) <teri.lindseth@alaska.gov>
**Subject:** Consultation Initiation For the Alaska Cargo and Cold Storage Project at Ted Stevens Anchorage International Airport

Good morning,

On behalf of the Federal Aviation Administration, and Alaska Cargo and Cold Storage, LLC, please review the attached consultation initiation letter for the proposed Alaska Cargo and Cold Storage Project at Ted Stevens Anchorage International Airport.

The attached initiation letter PDF contains:

- A description of the project,
- A description of the FAA's undertaking,
- A preliminary area of potential effects,
- A description of proposed identification efforts, and,
- Two map figures.

Please let me know if you have any issues with the PDF file, or if you have any questions or concerns regarding the information presented therein.

Thank you for your attention and we look forward to hearing from you!

Have a great weekend!

Sincerely,
Amy

**Amy Ramirez**
Cultural Resource Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1164 | direct
*dowl.com*

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Mr. Rick Harrison
Chickaloon Moose Creek Native Association (CMCNA)
P.O. Box 875046
Wasilla, Alaska 99687

Dear Mr. Harrison,

In accordance with Section 161 of Public Law 108-199, Section 518 of Public Law 108-447 and E.O. 13175, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

The proposed Alaska Cargo and Cold Storage development project site is on the east side of ANC – east of Runway 15/33, south of Taxiway P, west of Postmark Drive, and north of the Aircraft Rescue and Fire Fighting Station. The Alaska Cargo Cold Storage project purpose is to construct an energy-efficient, climate-controlled air cargo warehouse facility and hardstand parking for cargo jets at ANC. The need for additional cargo storage and infrastructure stems from the high volume and cargo traffic at ANC, the projected growth, and the key location of ANC for Trans-Pacific cargo. The proposed Project features may include the following (Figure 2):

- New Aircraft Parking Apron (eight hardstands)
- Climate-controlled Cargo Warehouse
- Hardstand Fuel Distribution
- Ground Support Equipment Shop and Parking
- Ancillary Space
- Road Connection to Postmark Drive

The Federal Action requested of the FAA by ANC is approval from the Federal to update their ALP. for a new aircraft parking apron to provide connections required for Alaska Cargo and Cold Storage cargo and warehouse development site, which is subject to the National Environmental Policy Act (NEPA) review process. As such the FAA is preparing an Environmental Assessment (EA) for the Alaska Cargo and Cold Storage development project. The FAA's authority over the proposed Project consists solely of reviewing and approving of the final construction designs and as-built surveys to approve the change to the ANC's ALP.

The draft EA for this proposed project was released for public comment on September 4, 2023 and the FAA is currently reviewing comments in preparation of the Final EA and Record of Decision

I would like to invite you to review the information on the proposed Alaska Cargo and Cold Storage development project and evaluate whether you believe there may be potential for this action to affect tribal trust and/or subsistence resources. This invitation is made pursuant to FAA's policy for government-to-government consultation with American Indian and Alaska Native tribes (FAA Order 1210.20).

If you have questions, comments or concerns related to this proposed Alaska Cargo and Cold Storage development project, please feel free to contact me at 907-271-5030 or *Kendall.D.Campbell@faa.gov*.

If you believe that tribal rights and/or protected resources may be affected by this Project and would like to engage in government-government consultation with FAA please advise me, in writing using the contact information provided above or contact me via email at *Kendall.D.Campbell@faa.gov*.

Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:47:35 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


Project APE

Airport Property Boundary

N

Feet

0 1,800 3,600

**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft


Project APE
Proposed Project

0 150 300 Feet

N

**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Chief Gary Harrison
Chickaloon Village Tribal Council
P.O. Box 1105
Chickaloon, AK 99674-1105
Cc: Ms. Jennifer Winnestaffer, Environmental Stewardship Director

Dear Chief Gary Harrison:

In recognition of the Federal Aviation Administration's (FAA) government-to-government relationship with Chickaloon Village Tribal Council and our federal trust responsibility, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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- Climate-controlled Cargo Warehouse
- Hardstand Fuel Distribution
- Ground Support Equipment Shop and Parking
- Ancillary Space
- Road Connection to Postmark Drive

The Federal Action requested of the FAA by ANC is approval from the Federal to update their ALP. for a new aircraft parking apron to provide connections required for Alaska Cargo and Cold Storage cargo and warehouse development site, which is subject to the National Environmental Policy Act (NEPA) review process. As such the FAA is preparing an Environmental Assessment (EA) for the Alaska Cargo and Cold Storage development project. The FAA's authority over the

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I would like to invite you to review the information on the proposed Alaska Cargo and Cold Storage development project and evaluate whether you believe there may be potential for this action to affect tribal trust and/or subsistence resources. This invitation is made pursuant to FAA's policy for government-to-government consultation with American Indian and Alaska Native tribes (FAA Order 1210.20).

If you have questions, comments or concerns related to this proposed Alaska Cargo and Cold Storage development project, please feel free to contact me at 907-271-5030 or *Kendall.D.Campbell@faa.gov*.

If you believe that tribal rights and/or protected resources may be affected by this Project and would like to engage in government-government consultation with FAA please advise me, in writing using the contact information provided above or contact me via email at *Kendall.D.Campbell@faa.gov*.

Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:36:31 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


Project APE

Airport Property Boundary

N

Feet

0 1,800 3,600

**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft


**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Ms. Suzanne Settle, Vice President
Energy, Land and Resources
Cook Inlet Region Inc.
PO Box 93330
Anchorage, Alaska 99509
Cc: Chait Borade, Director of Land and Resources

Dear Ms. Suzanne Settle:

In accordance with Section 161 of Public Law 108-199, Section 518 of Public Law 108-447 and E.O. 13175, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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If you believe that tribal rights and/or protected resources may be affected by this Project and would like to engage in government-government consultation with FAA please advise me, in writing using the contact information provided above or contact me via email at *Kendall.D.Campbell@faa.gov*.

Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:31:38 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


**PROJECT LOCATION & VICINITY**

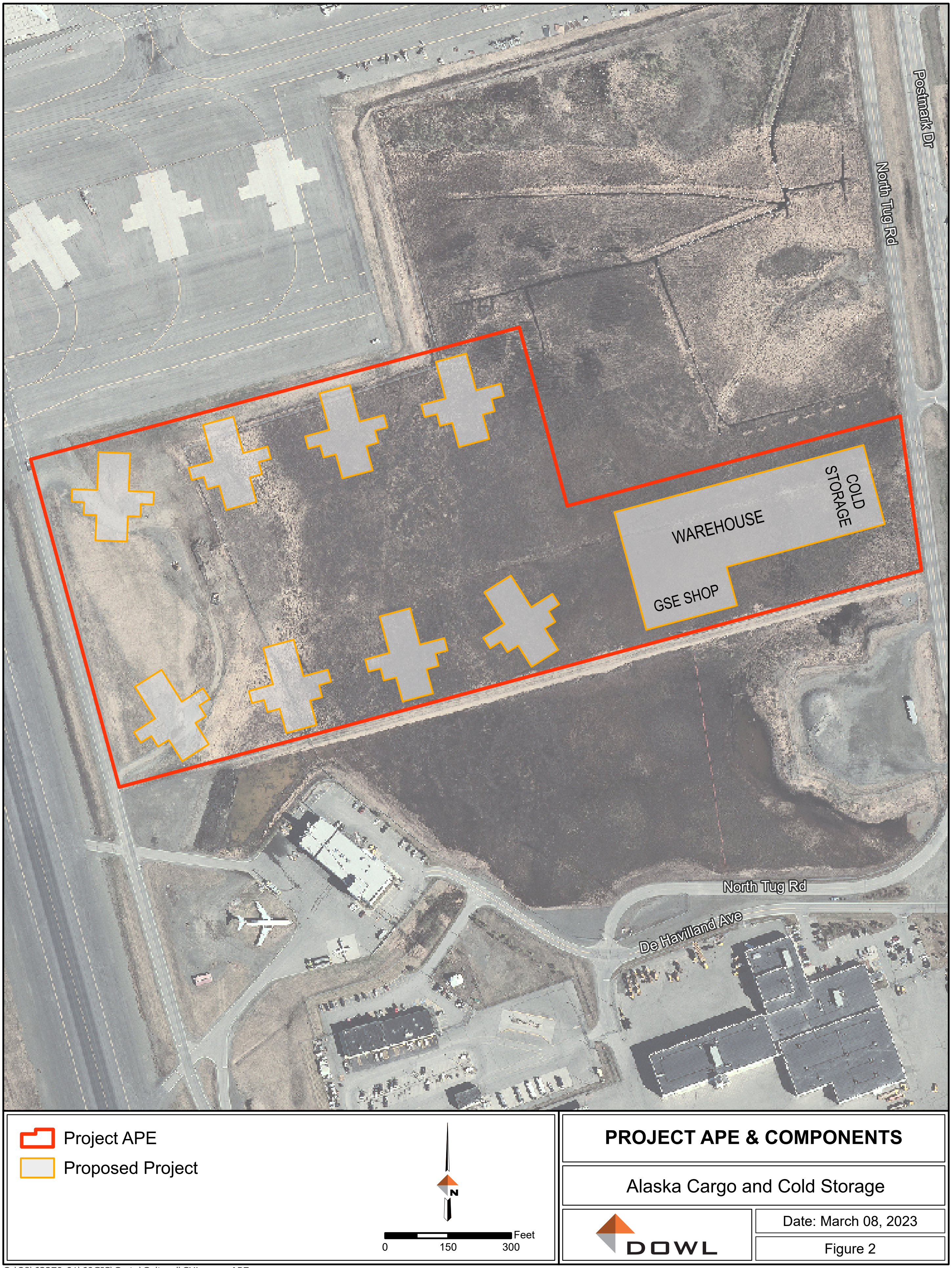
Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft




**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

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U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Ms. Gloria O'Neil, President
Cook Inlet Tribal Council
3600 San Jeronimo Drive
Anchorage, Alaska 99508

Dear Ms. Gloria O'Neil:

In accordance with Section 161 of Public Law 108-199, Section 518 of Public Law 108-447 and E.O. 13175, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:39:16 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft


**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Mr. Kyle Smith
Eklutna, Inc.
16515 Centerfield Drive, Suite 201
Eagle River AK 99577

Mr. Kyle Smith:

In accordance with Section 161 of Public Law 108-199, Section 518 of Public Law 108-447 and E.O. 13175, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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I would like to invite you to review the information on the proposed Alaska Cargo and Cold Storage development project and evaluate whether you believe there may be potential for this action to affect tribal trust and/or subsistence resources. This invitation is made pursuant to FAA's policy for government-to-government consultation with American Indian and Alaska Native tribes (FAA Order 1210.20).

If you have questions, comments or concerns related to this proposed Alaska Cargo and Cold Storage development project, please feel free to contact me at 907-271-5030 or *Kendall.D.Campbell@faa.gov*.

If you believe that tribal rights and/or protected resources may be affected by this Project and would like to engage in government-government consultation with FAA please advise me, in writing using the contact information provided above or contact me via email at *Kendall.D.Campbell@faa.gov*.

Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:43:20 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


Project APE

Airport Property Boundary

N

Feet
0 1,800 3,600

**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft


Project APE

Proposed Project

Feet
0 150 300

**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Mr. Raymond Theodore, President
Knikatnu, Inc.
PO Box 872130
Wasilla AK 99687 2130

Dear Mr. Raymond Theordore:

In accordance with Section 161 of Public Law 108-199, Section 518 of Public Law 108-447 and E.O. 13175, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:45:57 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity
Imagery Layer: Maxar, Microsoft


**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Mr. Alfred Tellman, President
Knik Tribal Council
PO Box 871565
Wasilla, AK 99687
Cc: Mr. Richard Martin, Historic Preservation Officer/Tribal Mapper,

Dear Mr. Alfred Tellman:

In recognition of the Federal Aviation Administration's (FAA) government-to-government relationship with Knik Tribal Council and our federal trust responsibility, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:33:24 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


Project APE

Airport Property Boundary

N

Feet

0 1,800 3,600

**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

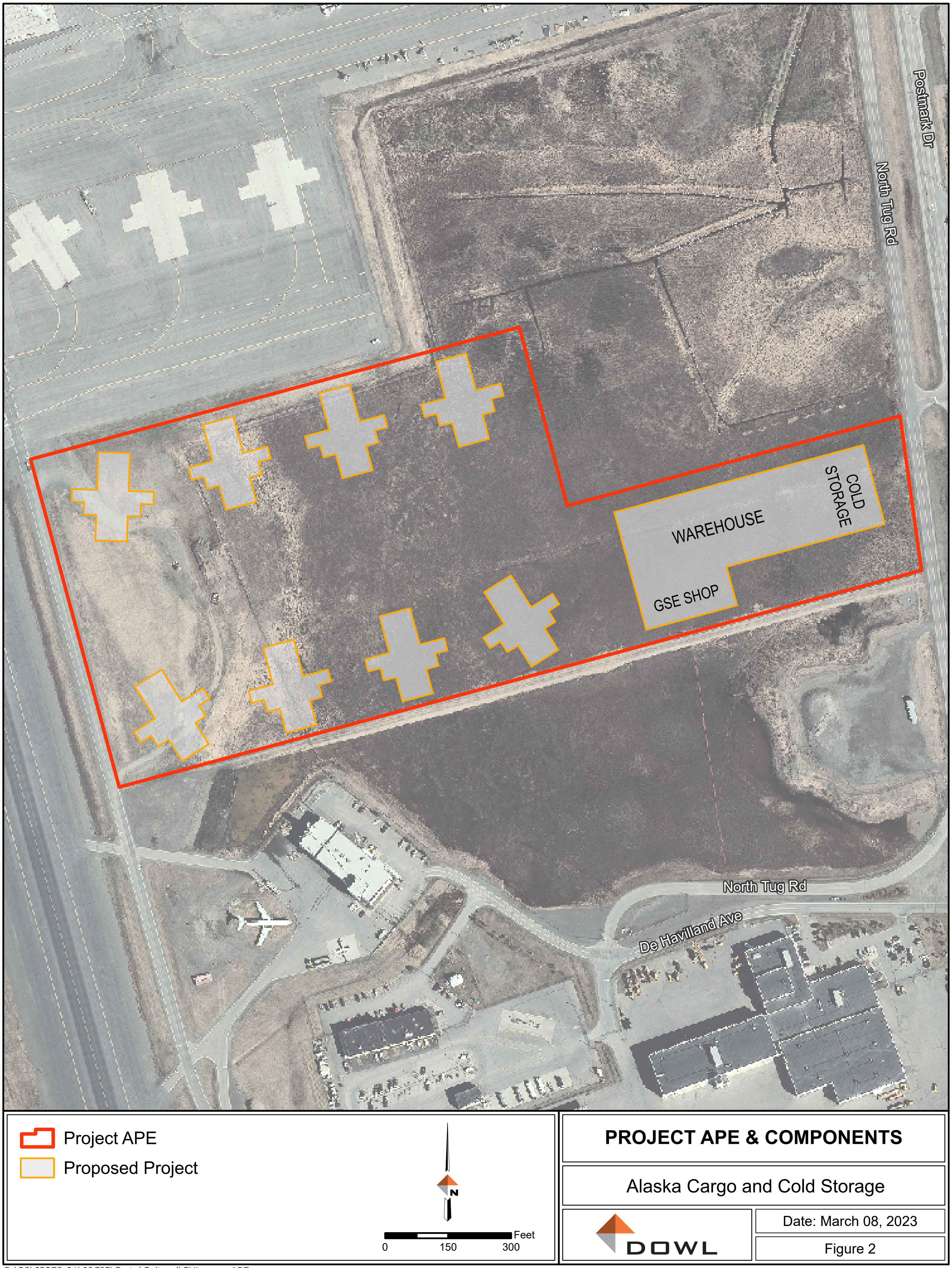
DOWL

Date: March 08, 2023

Figure 1

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx Location Vicinity

Imagery Layer: Maxar, Microsoft




**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

U.S. Department
of Transportation

**Federal Aviation
Administration**

AIRPORTS DIVISION

222 W. 7th Avenue, Box 14
Anchorage, Alaska
99513-7587

February 2, 2024

Aaron Leggett, President
Native Village of Eklutna
26339 Eklutna Village Rd.
Chugiak, Alaska 99567
Cc: Brenda Hewitt, Tribal Administrator

Mr. Aaron Leggett:

In recognition of the Federal Aviation Administration's (FAA) government-to-government relationship with Native Village of Eklutna and our federal trust responsibility, I am writing to inform you that Ted Stevens Anchorage International Airport (ANC) has submitted an update to their Airport Layout Plan (ALP) which includes the construction of the Alaska Cargo and Cold Storage development project at ANC in Anchorage, Alaska (Figure 1). Current information about this proposed Project can be found at the following link in the "News and Highlights" section and is also summarized below (https://dot.alaska.gov/anc/).

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If you have questions, comments or concerns related to this proposed Alaska Cargo and Cold Storage development project, please feel free to contact me at 907-271-5030 or *Kendall.D.Campbell@faa.gov*.

If you believe that tribal rights and/or protected resources may be affected by this Project and would like to engage in government-government consultation with FAA please advise me, in writing using the contact information provided above or contact me via email at *Kendall.D.Campbell@faa.gov*.

Sincerely,

Kendall Campbell

Digitally signed by KENDALL DIANNE CAMPBELL
Date: 2024.02.02 16:26:28 -09'00'

Kendall Campbell,
FAA Alaskan Region Tribal Consultation Official
Cultural Resource EPS
Alaska Region Airports Division
Federal Aviation Administration
222 West 7th Avenue, MS #14
Anchorage, AK 99513
Phone: 907-271-5030
Fax: 907-271-2851
Email: Kendall.d.campbell@faa.gov


**PROJECT LOCATION & VICINITY**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 1

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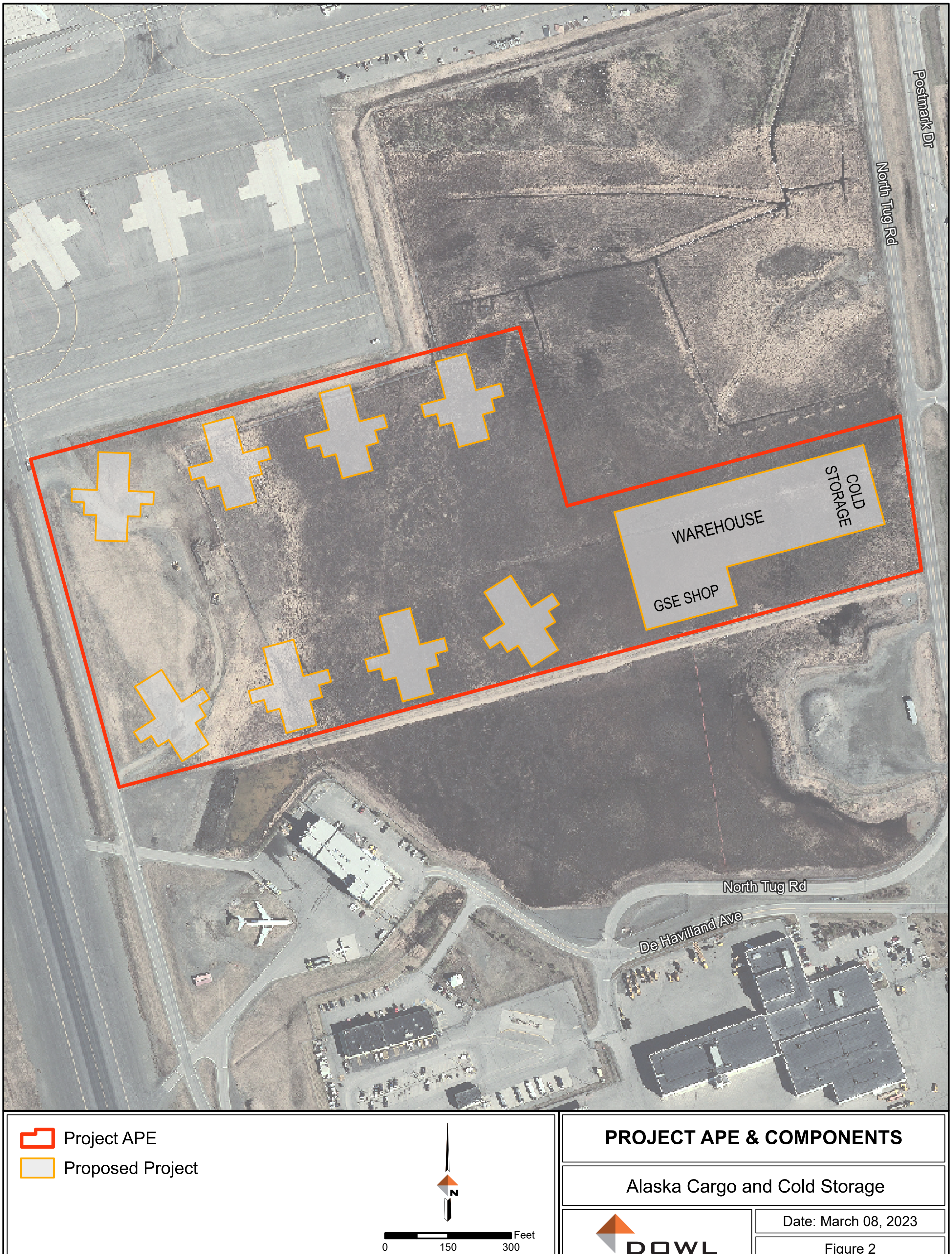
Imagery Layer: Maxar, Microsoft




**PROJECT APE & COMPONENTS**

Alaska Cargo and Cold Storage

DOWL

Date: March 08, 2023

Figure 2

Q:\38\63279-01\60GIS\Carto\Cultural\CUL.aprx APE

## Theresa Dutchuk

| | |
|---|---|
| **From:** | Kyle Smith <ksmith@eklutnainc.com> |
| **Sent:** | Monday, February 12, 2024 9:38 AM |
| **To:** | Emily Corley |
| **Cc:** | Noel Aspiras; kendall.d.campbell@faa.gov; john.johansen@alaska.gov; Theresa Dutchuk; kristi.m.ponozzo@faa.gov |
| **Subject:** | [EXT] RE: Alaska Cargo and Cold Storage Development Project Request for Comment |

***WARNING:*** *External Sender - use caution when clicking links and opening attachments.*

No comments on the tribal trust or subsistence issues from Eklutna Inc.


**Kyle S. Smith**
**Director of Land Assets**
**Eklutna, INC.**
D: (206) 769-5627
O: (907) 696-9613


*Together, with integrity, we build our company to grow profits and opportunities for all shareholders.*



---

**From:** Emily Corley <ecorley@dowl.com>
**Sent:** Monday, February 5, 2024 3:59 PM
**To:** Kyle Smith <ksmith@eklutnainc.com>
**Cc:** Noel Aspiras <naspiras@eklutnainc.com>; kendall.d.campbell@faa.gov; john.johansen@alaska.gov; Theresa Dutchuk <tdutchuk@dowl.com>; kristi.m.ponozzo@faa.gov
**Subject:** Alaska Cargo and Cold Storage Development Project Request for Comment

Good afternoon,

On behalf of the Federal Aviation Administration, attached please find a letter requesting your comments related to any potential impacts to tribal trust and/or subsistence resources for the proposed Alaska Cargo and Cold Storage development project.

Please do not hesitate to contact with any questions.

Thank you and have a great week!

Emily


**Emily Corley** *(she/her)*
Cultural Resources Specialist

# APPENDIX D:

# NOISE ANALYSIS

# MEMORANDUM

| | |
|---|---|
| TO: | Jason Gamache & Matt VanGoethem, MCG Explore Design |
| | Theresa Dutchuk, Dowl |
| FROM | Joshua Dunham & Erik Miller-Klein, Tenor Engineering |
| DATE: | June 7, 2022 |
| PROJECT: | Alaska Cargo and Cold Storage |
| SUBJECT: | FAA Area Equivalent Method Acoustical Compliance Analysis |

This memorandum is a summary of our Area Equivalent Method (AEM) noise analysis, as prescribed in FAA Order 1050.1F Desk Reference section 11.1.3 "FAA Aircraft Noise Screening Tools and Methodologies," for the Alaska Cargo and Cold Storage at Ted Stevens Anchorage International Airport (ANC) in Anchorage, Alaska.

## Relevant FAA Criteria & Procedure

An Area Equivalent Method (AEM) analysis was performed using the AEM 2c SP2 Microsoft Excel tool available on the FAA website. The following language from FAA Order 1050.1F Desk Reference section 11.1.3 indicates when this screening tool is to be used:

> *"For use in evaluating proposed actions and alternative(s) at an airport which result in a general overall increase in daily aircraft operations or the use of larger/noisier aircraft, as long as there are no changes in ground tracks, flight profiles or runway use. If the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1 dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. If the AEM calculations indicate an increase of 17 percent or more, or if the action is such that use of the AEM is not appropriate, then the noise analysis must be performed using the Aviation Environmental Design Tool (AEDT) to determine if significant noise impacts would result."*

A user's guide for the AEM 2c SP2 Microsoft Excel tool is also available on the FAA website. It is worth noting the following language from the user's guide document:

> *"Whether an AEM-proposed screening analysis is appropriate depends upon the changes under study in the airport vicinity. AEM use is limited to changes in fleet mix and number of operations. It cannot be used to evaluate new procedures, alternative track load, or any other changes to airspace structure or utilization that would alter the location of aircraft flights, corresponding noise, and the general shape of the contour."*

## AEM Analysis Methods

The AEM analysis requires per-day landing and takeoff data (LTO) during daytime operation (7 am to 10 pm*) and nighttime operation (10 pm to 7 am*), separated out by aircraft type. Annual LTO data is available that was forecasted for the year 2020 in Table D9 of the December 2015 report entitled *Ted Stevens Anchorage International Airport FAR Part 150 Noise Compatibility Study Update.* Refer to Appendix A for this data.

This annual data is divided by 365.25 days/year to obtain daily data by aircraft. This daily data is entered into the AEM 2c SP2 Microsoft Excel tool for both *Base Case* and *Alternative Case*. All data was assumed to be Daytime LTO cycles since no further information appears to be available regarding nighttime operations and the cargo operations associated with the Alaska Cargo and Cold Storage operations are predicted to align with the normal daytime and nighttime averages. The only change made to the *Alternative Case* is the addition of 18 daily LTOs for the additional aircraft type: 747-8. Refer to Appendix B to see the inputs used in the AEM 2c SP2 Microsoft Excel tool. If a more accurate daytime and nighttime accounting are needed, then a full accounting of average daytime and nighttime flights and aircraft are necessary.

*Refer to pg C39 of *Ted Stevens Anchorage International Airport FAR Part 150 Noise Compatibility Study Update.*

## AEM Analysis Results

The AEM analysis indicates that the suggested action will result in a 5.2% increase in the DNL 65 dB contour area; this is well below the 17% threshold (see Appendix B, outlined in purple). Therefore, per FAA Order 1050.1F Desk Reference section 11.1.3, there will be no significant impact over noise sensitive areas, and no further noise analysis is required.

However, while the FAA screening method does not trigger the need for a further AEDT analysis, this highly simplified metric does NOT guarantee that the proposed changes will not cause noise impacts to the adjacent properties to the west and northwest of the proposed cargo operation center.

It is worth noting the following:

1. The user guide indicates that the AEM calculation *"is limited to changes in fleet mix and number of operations. It cannot be used to evaluate new procedures… or any other changes".* In this case, the additional aircraft represent a change in the number of operations, but primarily considers the flight impact and not specifically the proposed changes for ground operations and taxiing.
2. B206L and R22 Helicopters and S70 military aircraft included in the forecasted LTO data are not listed as options in the AEM 2c SP2 Microsoft Excel tool and were therefore excluded from both the *Base Case* and *Alternative Case*. It is expected that since the percentage of aircraft is relative between the two cases, this exclusion should not impact the results. These are highlighted in yellow in Appendix A.

## Conclusion

Per FAA Order 1050.1F Desk Reference section 11.1.3 "FAA Aircraft Noise Screening Tools and Methodologies," a detailed analysis using AEDT is not required. If additional noise impacts are desired please contact our office to complete either a detailed AEDT or CadnaA noise model analysis of the ground operations to the nearest portions of the community above and beyond FAA requirements.

Please contact us with any questions or additional coordination.

All the best,

JOSHUA DUNHAM
ACOUSTICAL CONSULTANT

ERIK MILLER-KLEIN, PE, INCE BOARD CERTIFIED
PRINCIPAL OF ACOUSTICAL ENGINEERING

tenor / Elevating acoustical design.
206.899.5450 / OFFICE
888.978.3667 / TOLL-FREE
JOSHUA.D@TENOR-ENG.COM
ERIK.MK@TENOR-ENG.COM

# Appendix A: Annual LTO Data at ANC



Table D9
OPERATIONS BY AIRCRAFT CATEGORY – 2009, 2020, 2030

| Typical Aircraft | Annual Operations | | |
|---|---|---|---|
| | 2009 | 2020 | 2030 |
| **Air Carrier Jet** | | | |
| DC1010 | 457 | 593 | 0 |
| MD11GE | 12,549 | 16,260 | 0 |
| 737400 | 15,698 | 0 | 0 |
| 737700 | 2,188 | 2,835 | 10,216 |
| 737800 | 13,297 | 37,568 | 41,985 |
| 747200 | 4,537 | 0 | 0 |
| 747400 | 27,321 | 41,273 | 46,125 |
| 757300 | 959 | 1,243 | 1,389 |
| 767300 | 2,929 | 3,795 | 4,241 |
| 777300 | 455 | 589 | 19,493 |
| 737N17 | 4,867 | 6,307 | 0 |
| 757PW | 2,630 | 3,407 | 3,808 |
| A319-131 | 1,197 | 1,551 | 1,733 |
| **Business Jet** | | | |
| CL600 | 121 | 157 | 176 |
| ECLIPSE500 | 295 | 383 | 428 |
| GII | 619 | 403 | 0 |
| GV | 1,880 | 2,836 | 3,620 |
| LEAR35 | 5,372 | 6,961 | 7,779 |
| MU3001 | 776 | 1,005 | 1,124 |
| **Helicopter** | | | |
| B206L | 533 | 691 | 772 |
| R22 | 1,971 | 2,553 | 2,854 |
| **Military** | | | |
| C130E | 2,150 | 512 | 0 |
| E3A | 52 | 27 | 27 |
| F15E20 | 16 | 8 | 8 |
| S70 | 2,167 | 1,120 | 1,120 |
| **Propeller** | | | |
| 1900D | 29,025 | 37,607 | 42,029 |
| BEC58P | 12,390 | 10,087 | 17,394 |
| CNA182FLT | 25,547 | 28,126 | 33,897 |
| CNA206 | 4,302 | 4,823 | 5,772 |
| CNA208 | 19,733 | 22,120 | 26,475 |
| CNA441 | 10,784 | 8,779 | 15,140 |
| DC3 | 761 | 985 | 0 |
| DHC-2FLT | 665 | 746 | 892 |
| DHC6 | 11,458 | 14,846 | 16,592 |
| DHC8 | 9,988 | 13,536 | 16,676 |
| EMB120 | 1,184 | 1,534 | 1,714 |
| GASEPF | 7,630 | 9,148 | 10,710 |
| GASEPV | 518 | 503 | 602 |
| SF340 | 17,611 | 22,818 | 25,501 |
| **Total Operations** | **256,632** | **307,735** | **360,293** |

**Source:** Landrum & Brown, 2012.

# Appendix B: AEM Model

**Federal Aviation Administration**
Office of Environment and Energy

6/6/2022

**Federal Aviation Administration**
Office of Environment and Energy
http://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/aem_model/

**Area Equivalent Method (AEM) Version 2c SP2**

| Airport Name/Code: | ANC |
|---|---|

| DNL (dBA) | Baseline Area (Sq. Mi.) | Alternative Area (Sq. Mi.) | Percent Change in Area |
|---|---|---|---|
| 65 | 4.1 | 4.4 | 5.2% |
| 70 | 1.6 | 1.7 | 4.4% |
| 75 | 0.7 | 0.7 | 3.6% |
| 80 | 0.3 | 0.3 | 2.8% |
| 85 | 0.1 | 0.1 | 2.1% |
| | | | |

| | BASE Case | | ALTERNATIVE Case | |
|---|---|---|---|---|
| Aircraft Type | Daytime LTO Cycles | Nighttime LTO Cycles | Daytime LTO Cycles | Nighttime LTO Cycles |
| 707 | | | | |
| 720 | | | | |
| 737 | | | | |
| 7478 | | | 18.00 | |
| 707120 | | | | |
| 707320 | | | | |
| 717200 | | | | |
| 727100 | | | | |
| 727200 | | | | |
| 737300 | | | | |
| 737400 | | | | |
| 737500 | | | | |
| 737700 | 7.76 | | 7.76 | |
| 737800 | 102.86 | | 102.86 | |
| 747100 | | | | |
| 747200 | | | | |
| 747400 | 113.00 | | 113.00 | |
| 757300 | 3.40 | | 3.40 | |
| 767300 | 10.39 | | 10.39 | |
| 767400 | | | | |
| 777200 | | | | |
| 777300 | 1.61 | | 1.61 | |
| 1900D | 102.96 | | 102.96 | |
| 707QN | | | | |
| 720B | | | | |
| 727D15 | | | | |
| 727D17 | | | | |
| 727EM1 | | | | |
| 727EM2 | | | | |
| 727Q15 | | | | |
| 727Q7 | | | | |
| 727Q9 | | | | |

**Federal Aviation Administration**
Office of Environment and Energy

6/6/2022

| | BASE Case | | ALTERNATIVE Case | |
|---|---|---|---|---|
| Aircraft Type | Daytime LTO Cycles | Nighttime LTO Cycles | Daytime LTO Cycles | Nighttime LTO Cycles |
| 727QF | | | | |
| 7373B2 | | | | |
| 737D17 | | | | |
| 737N17 | 17.27 | | 17.27 | |
| 737N9 | | | | |
| 737QN | | | | |
| 74710Q | | | | |
| 74720A | | | | |
| 74720B | | | | |
| 747SP | | | | |
| 757PW | 9.33 | | 9.33 | |
| 757RR | | | | |
| 767CF6 | | | | |
| 767JT9 | | | | |
| 7773ER | | | | |
| 7878R | | | | |
| A10A | | | | |
| A3 | | | | |
| A300-622R | | | | |
| A300B4-203 | | | | |
| A310-304 | | | | |
| A319-131 | 4.25 | | 4.25 | |
| A320-211 | | | | |
| A320-232 | | | | |
| A321-232 | | | | |
| A330-301 | | | | |
| A330-343 | | | | |
| A340-211 | | | | |
| A340-642 | | | | |
| A37 | | | | |
| A380-841 | | | | |
| A380-861 | | | | |
| A4C | | | | |
| A6A | | | | |
| A7D | | | | |
| A7E | | | | |
| B1 | | | | |
| B2A | | | | |
| B52BDE | | | | |
| B52G | | | | |
| B52H | | | | |
| B57E | | | | |
| BAC111 | | | | |
| BAE146 | | | | |
| BAE300 | | | | |
| BEC58P | 27.62 | | 27.62 | |
| C118 | | | | |
| C12 | | | | |
| C130 | | | | |
| C130AD | | | | |
| C130E | 1.40 | | 1.40 | |

**Federal Aviation Administration**
Office of Environment and Energy

6/6/2022

| | BASE Case | | ALTERNATIVE Case | |
|---|---|---|---|---|
| Aircraft Type | Daytime LTO Cycles | Nighttime LTO Cycles | Daytime LTO Cycles | Nighttime LTO Cycles |
| C-130E | | | | |
| C130HP | | | | |
| C131B | | | | |
| C135A | | | | |
| C135B | | | | |
| C137 | | | | |
| C140 | | | | |
| C141A | | | | |
| C17 | | | | |
| C18A | | | | |
| C-20 | | | | |
| C21A | | | | |
| C22 | | | | |
| C23 | | | | |
| C5A | | | | |
| C7A | | | | |
| C9A | | | | |
| CIT3 | | | | |
| CL600 | 0.43 | | 0.43 | |
| CL601 | | | | |
| CNA172 | | | | |
| CNA182 | | | | |
| CNA182FLT | 77.00 | | 77.00 | |
| CNA206 | 13.20 | | 13.20 | |
| CNA208 | 60.56 | | 60.56 | |
| CNA20T | | | | |
| CNA441 | 24.04 | | 24.04 | |
| CNA500 | | | | |
| CNA510 | | | | |
| CNA525C | | | | |
| CNA55B | | | | |
| CNA560E | | | | |
| CNA560U | | | | |
| CNA560XL | | | | |
| CNA680 | | | | |
| CNA750 | | | | |
| COMJET | | | | |
| COMSEP | | | | |
| CONCRD | | | | |
| CRJ9-ER | | | | |
| CRJ9-LR | | | | |
| CVR580 | | | | |
| DC1010 | 1.62 | | 1.62 | |
| DC1030 | | | | |
| DC1040 | | | | |
| DC3 | 2.70 | | 2.70 | |
| DC6 | | | | |
| DC820 | | | | |
| DC850 | | | | |
| DC860 | | | | |
| DC870 | | | | |

**Federal Aviation Administration**
Office of Environment and Energy

6/6/2022

| | BASE Case | | ALTERNATIVE Case | |
|---|---|---|---|---|
| Aircraft Type | Daytime LTO Cycles | Nighttime LTO Cycles | Daytime LTO Cycles | Nighttime LTO Cycles |
| DC8QN | | | | |
| DC910 | | | | |
| DC930 | | | | |
| DC93LW | | | | |
| DC950 | | | | |
| DC95HW | | | | |
| DC9Q7 | | | | |
| DC9Q9 | | | | |
| DHC-2FLT | 2.04 | | 2.04 | |
| DHC6 | 40.65 | | 40.65 | |
| DHC6QP | | | | |
| DHC7 | | | | |
| DHC8 | 37.06 | | 37.06 | |
| DHC830 | | | | |
| DO228 | | | | |
| DO328 | | | | |
| E3A | 0.07 | | 0.07 | |
| E4 | | | | |
| EA6B | | | | |
| ECLIPSE500 | 1.05 | | 1.05 | |
| EMB120 | 4.20 | | 4.20 | |
| EMB145 | | | | |
| EMB14L | | | | |
| EMB170 | | | | |
| EMB175 | | | | |
| EMB190 | | | | |
| EMB195 | | | | |
| F10062 | | | | |
| F10065 | | | | |
| F100D | | | | |
| F101B | | | | |
| F102 | | | | |
| F104G | | | | |
| F105D | | | | |
| F106 | | | | |
| F111AE | | | | |
| F111D | | | | |
| F-111F | | | | |
| F117A | | | | |
| F14A | | | | |
| F15A | | | | |
| F15E20 | 0.02 | | 0.02 | |
| F15E29 | | | | |
| F16A | | | | |
| F16GE | | | | |
| F16PW0 | | | | |
| F-18 | | | | |
| F28MK2 | | | | |
| F28MK4 | | | | |
| F4C | | | | |
| F-4C | | | | |

**Federal Aviation Administration**
Office of Environment and Energy

6/6/2022

| | BASE Case | | ALTERNATIVE Case | |
|---|---|---|---|---|
| Aircraft Type | Daytime LTO Cycles | Nighttime LTO Cycles | Daytime LTO Cycles | Nighttime LTO Cycles |
| F5AB | | | | |
| F5E | | | | |
| F8 | | | | |
| FAL20 | | | | |
| FB111A | | | | |
| GASEPF | 25.05 | | 25.05 | |
| GASEPV | 1.38 | | 1.38 | |
| GII | 1.10 | | 1.10 | |
| GIIB | | | | |
| GIV | | | | |
| GV | 7.76 | | 7.76 | |
| HS748A | | | | |
| IA1125 | | | | |
| JAGUAR | | | | |
| KC10A | | | | |
| KC135 | | | | |
| KC-135 | | | | |
| KC135B | | | | |
| KC135R | | | | |
| L1011 | | | | |
| L10115 | | | | |
| L188 | | | | |
| LEAR25 | | | | |
| LEAR35 | 19.06 | | 19.06 | |
| MD11GE | 44.52 | | 44.52 | |
| MD11PW | | | | |
| MD81 | | | | |
| MD82 | | | | |
| MD83 | | | | |
| MD9025 | | | | |
| MD9028 | | | | |
| MU3001 | 2.75 | | 2.75 | |
| OV10A | | | | |
| P3A | | | | |
| PA28 | | | | |
| PA30 | | | | |
| PA31 | | | | |
| PA42 | | | | |
| S3A&B | | | | |
| SABR80 | | | | |
| SD330 | | | | |
| SF340 | 62.47 | | 62.47 | |
| SR71 | | | | |
| T1 | | | | |
| T29 | | | | |
| T-2C | | | | |
| T3 | | | | |
| T33A | | | | |
| T34 | | | | |
| T37B | | | | |
| T-38A | | | | |

**Federal Aviation Administration**
Office of Environment and Energy

6/6/2022

| | BASE Case | | ALTERNATIVE Case | |
|---|---|---|---|---|
| Aircraft Type | Daytime LTO Cycles | Nighttime LTO Cycles | Daytime LTO Cycles | Nighttime LTO Cycles |
| T39A | | | | |
| T41 | | | | |
| T42 | | | | |
| T-43A | | | | |
| T44 | | | | |
| TORNAD | | | | |
| TR1 | | | | |
| U2 | | | | |
| U21 | | | | |
| U6 | | | | |
| U8F | | | | |
| **Total LTOs** | 830.58 | | 848.58 | |

**DOWL**
(907) 562-2000 | office
(907) 865-1267 | direct
*dowl.com*

# APPENDIX E: WETLANDS

## TABLE OF CONTENTS

**DEPARTMENT OF THE ARMY**
**ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS**
**REGULATORY DIVISION**
**P.O. BOX 6898**
**JBER, AK 99506-0898**

June 3, 2021

Regulatory Division
POA-2021-00121

Mr. Jason Gamache
MCG Explore Design
421 W. 1st Ave, #300
Anchorage, Alaska 99501

Dear Mr. Gamache:

This is in response to your March 30, 2021, request for an approved jurisdictional determination (AJD) for the proposed Alaska Cargo and Cold Storage, LLC (ACCS) to be located at the Ted Stevens Anchorage International Airport on an parcel of land described as west of North Tug Road and north of De Haviland Avenue. It has been assigned number POA-2021-00121, Knik Arm, which should be referred to in all correspondence with us. The project site is located within Section 28, T. 13 N., R. 4W., Seward Meridian; USGS Quad Map Anchorage A-8NW; Latitude 61.185113°º N., Longitude 149.993360º W.; in Anchorage, Alaska.

Based on our review of the information you furnished and available to us and our May 19, 2021, site visit, we have determined the above property contains waters of the United States (U.S.), including wetlands, under the Corps of Engineers' (Corps) regulatory jurisdiction. There are approximately 20.6 acres of wetlands on the ACCS site. These waters of the U.S. are shown on the enclosed drawing prepared by the Corps and dated May 26, 2021. A copy of the AJD form is available under the above file number at the following address:
www.poa.usace.army.mil/Missions/Regulatory/Jurisdictional-Determinations/
Jurisdictional-Determination-Archive/.

This AJD is valid for five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Enclosed is a Notification of Administrative Appeal Options and Process and Request for Appeal form (see section titled "Approved Jurisdictional Determination").

Department of the Army (DA) authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

You can find a copy of the DA permit application online at the following address: www.poa.usace.army.mil/Missions/Regulatory/Permits/#expermits. Please see the sample drawings on our website: www.poa.usace.army.mil/Portals/34/docs/regulatory/ChecklistDrawings-PermitApplication.pdf.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at: Bryan.A.Herczeg@usace.army.mil, by mail at the address above, by phone at (907) 753-2772, if you have questions. For more information about the Regulatory Program, please visit our website at: www.poa.usace.army.mil/Missions/Regulatory.

Sincerely,

Bryan A. Herczeg

Bryan A. Herczeg
Project Manager

Enclosures

cc:

| | |
|---|---|
| Jason Gamache | jgamache@ExploreDesign.com |
| Robin Reich | robin@solsticeak.com |


Rockwell Ave
Lake Hood Dr
Sikorsky Ave
N Tug Rd
De Havilland Ave
Postmark Dr
Tom Wardleigh Dr
Aircraft Dr

## NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

| Applicant: Jason Gamache, MCG Explore Design | | File Number: POA-2021-00121 | Date: June 8, 2021 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | | B |
| | PERMIT DENIAL | | C |
| X | APPROVED JURISDICTIONAL DETERMINATION | | D |
| | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

## POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

| If you have questions regarding this decision and/or the appeal process you may contact: | If you only have questions regarding the appeal process you may also contact: |
|---|---|
| **Bryan Herczeg**<br>Alaska District Corps of Engineers<br>CEPOA-RD-S<br>P.O. Box 6898<br>JBER, AK 99506-0898<br>(907) 753-2772 | Ms. Kate Bliss<br>Regulatory Program Manager<br>U.S. Army Corps of Engineers, Pacific Ocean Division<br>CEPOD-PDC, Bldg 525<br>Fort Shafter, HI 96858-5440<br>(808) 835-4626<br>kate.m.bliss@usace.army.mil |

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

| | | |
|---|---|---|
| ______________________________<br>Signature of appellant or agent. | Date: | Telephone number: |

**DEPARTMENT OF THE ARMY**
**ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS**
**REGULATORY DIVISION**
**P.O. BOX 6898**
**JBER, AK 99506-0898**

June 30, 2023

Regulatory Division
POA-2021-00121

Mr. Joe Jacobson
Alaska Cargo and Cold Storage, LLC
3800 Centerpoint Drive, Suite 1100
Anchorage, AK 99503

Mr. Craig Campbell
Ted Stevens Anchorage International Airport
P.O. Box 196960
Anchorage, AK 99519

Dear Mr. Jacobson and Mr. Campbell:

Enclosed is an unsigned copy of Department of the Army permit POA-2021-00121, Knik Arm, which would authorize the construction of a concrete pad within wetlands to support a cargo storage facility and attendant features. The project site is located at Latitude 61.1840º N, Longitude 149.9940º W; Ted Stevens Anchorage International Airport (TSAIA), Anchorage, Alaska.

The Alaska Department of Environmental Conservation has issued a Certificate of Reasonable Assurance pursuant to Section 401 of the Clean Water Act for your project and found it to be in accordance with the Alaska Water Quality Standards. This certification is attached to the Department of the Army permit and will become a part of this permit when it is finalized.

Additionally, we have enclosed a Notification of Administrative Appeal Options and Process and Request for Appeal form regarding this Department of the Army Permit (see section labeled “Initial Proffered Permit”).

If you accept the conditions of the enclosed permit, please sign and date the permit and return it to us, along with your $100.00 permit fee. You can pay this fee online at https://www.pay.gov/public/form/start/996412796. Instructions on how to pay online can be found at https://usace.contentdm.oclc.org/utils/getfile/collection/p16021 coll11/id/5786. If you make an online payment, please include a copy of your receipt when you return your signed permit. You may also pay this fee with a check mailed to the address above. Your check or money order should be made payable to FAO, USACE, Alaska District. The permit will not be valid until we have returned a finalized copy to you. This is not an authorization to commence construction. No work is to be performed in wetlands until you have received a validated copy of the permit.

Nothing in this letter shall be construed as excusing you from compliance with other Federal, State, or local statutes, ordinances, or regulations which may affect this work.

Please contact me via email at roberta.k.budnik@usace.army.mil, by mail at the address above, by phone at (907) 753-2785, or toll free from within Alaska at (800) 478-2712, if you have questions or to request a hard copy of this letter and enclosures. For more information about the Regulatory Program, please visit our website at www.poa.usace.army.mil/Missions/Regulatory.

Sincerely,

Roberta K. Budnik

Roberta K. Budnik
Project Manager

Enclosures

# DEPARTMENT OF THE ARMY PERMIT

**Permittee: Alaska Cargo and Cold Storage, LLC and Ted Stevens Anchorage International Airport**

**Permit No.: POA-2021-00121**

**Issuing Office: U.S. Army Engineer District, Alaska**

**NOTE**: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

**Project Description**: Discharge up to 653,022 cubic yards of fill material (concrete, asphalt, base course, MOA Type II, Type III) into a total of 21.6 acres of wetlands to construct a new, 29-acre concrete pad to support a cargo storage facility building, airside and landside loading areas, outdoor storage, vehicle parking, eight (8) hardstands for aircraft parking, and emergency and maintenance vehicle access around the building.

All work will be performed in accordance with the attached plan, sheets **1-7**, dated **June 17, 2022**.

**Project Location**: Latitude 61.1840º N, Longitude 149.9940º W; Ted Stevens Anchorage International Airport (TSAIA), Anchorage, Alaska.

**Permit Conditions**:

**General Conditions**:

1. The time limit for completing the work authorized ends on **June 30, 2028**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

**Special Conditions**:

1. The permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the authorized work area. The erosion control measures shall remain in place and be maintained until all authorized work is completed and the work areas are stabilized. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion.

2. The permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, automotive parts, asphalt, construction materials, concrete blocks with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

3. No stockpiling of fill materials shall occur in wetlands or other waters of the U.S. that do not have DA authorization.

4. Natural drainage patterns shall be maintained using appropriate ditching, culverts, storm drain systems, and other measures to ensure hydrology is not altered.

5. Prior to commencing the work authorized by this permit, the permittee shall utilize 9.28 Klatt Bog Credits to partially offset the project's calculated 13.73 debits. To offset the remaining 4.45 debits, the permittee shall purchase 14.685 credits of the appropriate type from Harmany Ranch Wetland Mitigation Bank, as proposed by the permittee and approved by the Corps. Such credit utilization and purchase will offset the loss of 21.6 acres of palustrine emergent and scrub-shrub wetlands. You must email the signed credit transaction form to mitigationmanager@usace.army.mil and to Roberta Budnik (roberta.k.budnik@usace.army.mil) upon completion of credit transaction (see form attached). If you are unable to complete this transaction, you are required to obtain a permit modification prior to commencing the work authorized by this permit for approval of an alternate mitigation method.

6. Within 60 days of completion of the work authorized by this permit, the Permittee shall submit as-built drawings of the authorized work and a completed "As-Built Certification By Professional Engineer" form (attached) to the Corps (U.S. Army Corps of Engineers, Regulatory Division, by email at regpagemaster@usace.army.mil and Ms. Roberta Budnik, Project Manager at roberta.k.budnik@usace.army.mil). The as-built drawings shall be signed and sealed by a registered professional engineer and include the following:

a. A list of any deviations between the work authorized by this permit and the work as constructed. In the event that the completed work deviates, in any manner, from the authorized work, describe on the attached "As-Built Certification By Professional Engineer" form the deviations between the work authorized by this permit and the work as constructed. Clearly indicate on the as-built drawings any deviations that have been listed. Please note that the depiction and/or description of any deviations on the drawings and/or "As-Built Certification By Professional Engineer" form does not constitute approval of any deviations by the Corps.

b. Include the Department of the Army permit number on all sheets submitted.

7. All contractors involved in this permitted activity shall be provided copies of this permit in its entirety. A copy shall remain on site at all times during construction.

**Further Information**:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorization required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a revaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) AND TITLE (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

FOR (DISTRICT COMMANDER) (DATE)
Colonel Damon A. Delarosa
Roberta K. Budnik, Project Manager
South Branch, Regulatory Division

When the structures or work authorized by this permit are still in existence at the time the property is transferred the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions have the transferee sign and date below.

(TRANSFEREE) (DATE)

# LEGEND

PROJECT LIMITS

LEASE LOT PROPERTY LINES

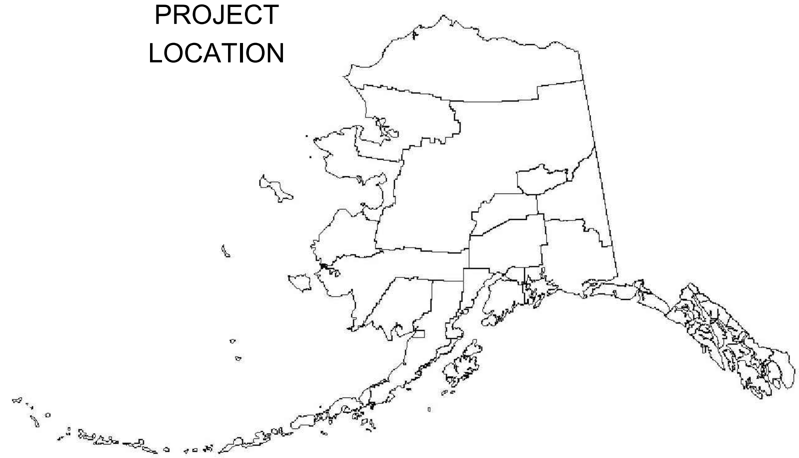
EDGE OF ASPHALT

SUBJECT PROPERTY

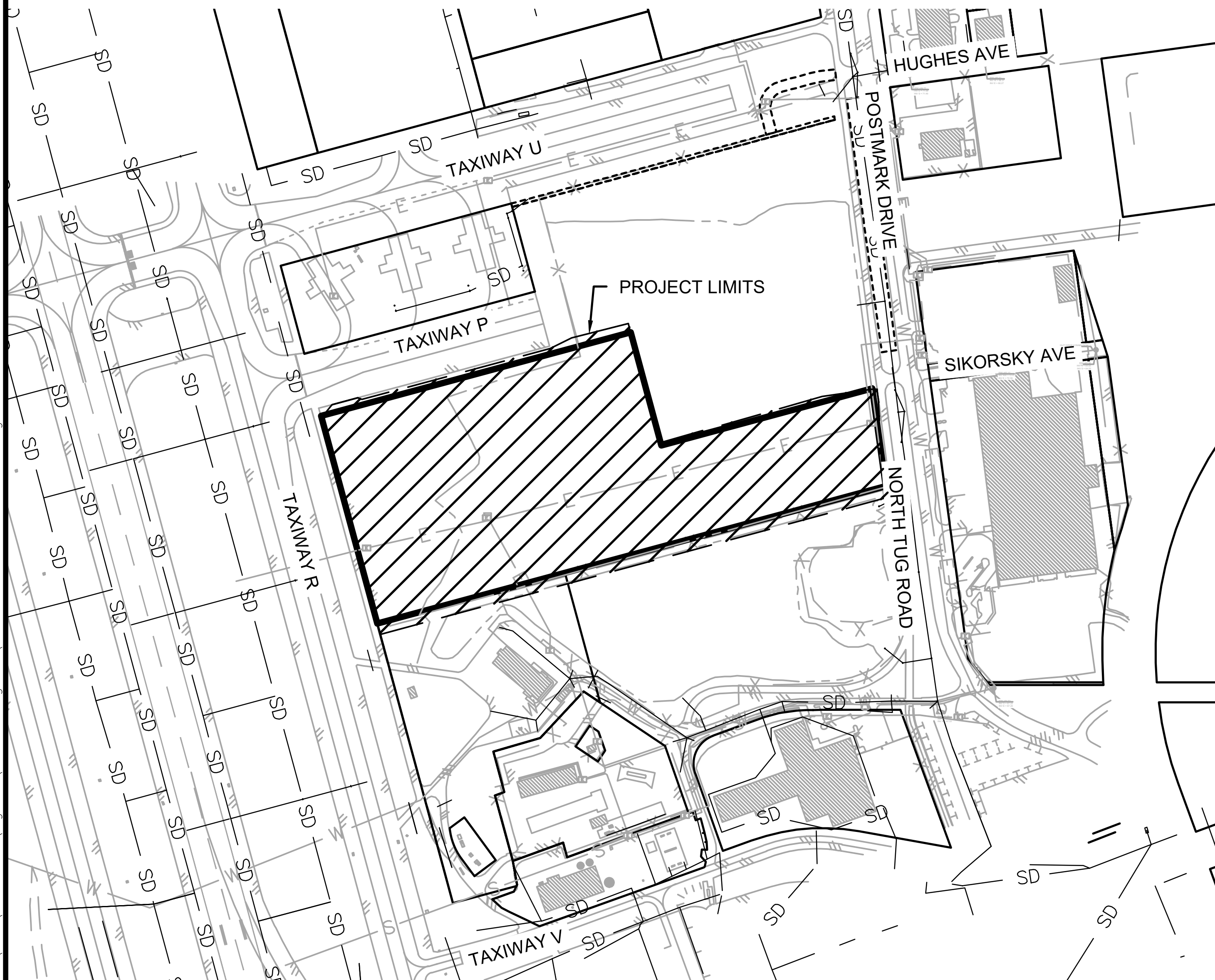
600 0 600

SCALE IN FEET

PROJECT LOCATION



## LOCATION MAP

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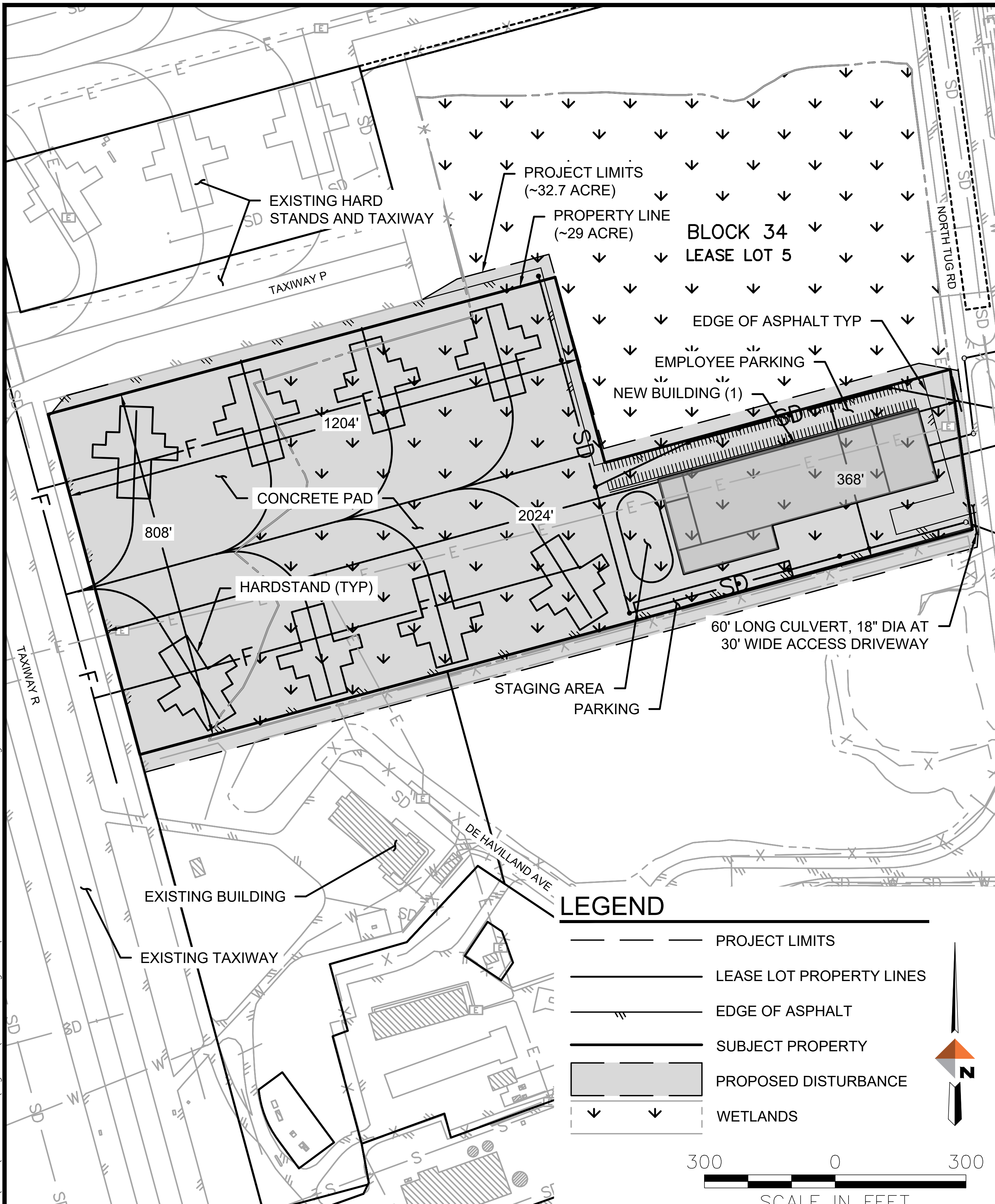
Anchorage, Alaska 99503
907-562-2000


ALASKA CARGO & COLD STORAGE WAREHOUSE VICINITY MAP

| | |
|---|---|
| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

SHEET 1 of 7

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# ALASKA CARGO & COLD STORAGE WAREHOUSE SITE PLAN

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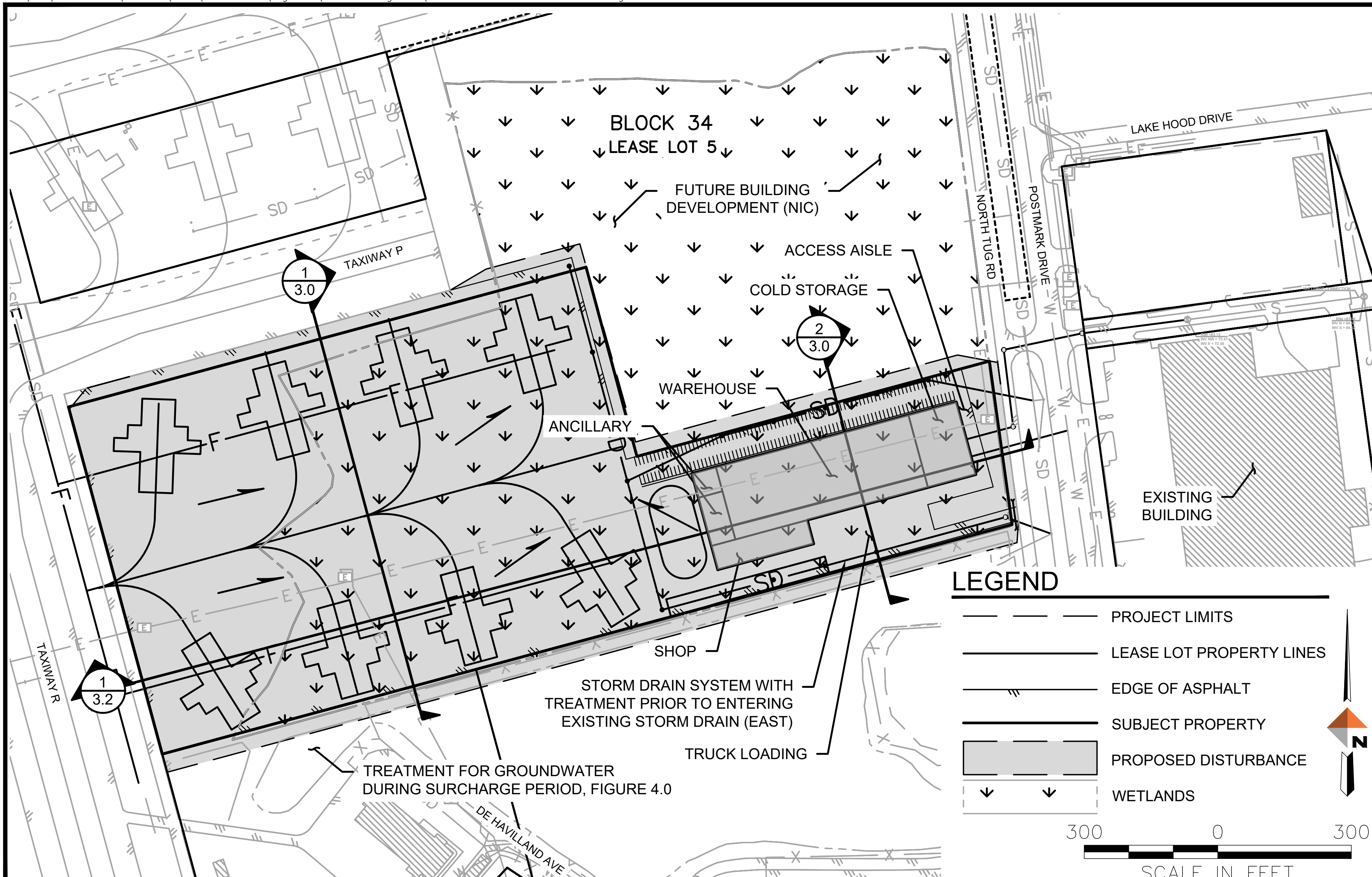
|---|---|
| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

SHEET 2 of 7

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# ALASKA CARGO & COLD STORAGE WAREHOUSE SITE PLAN

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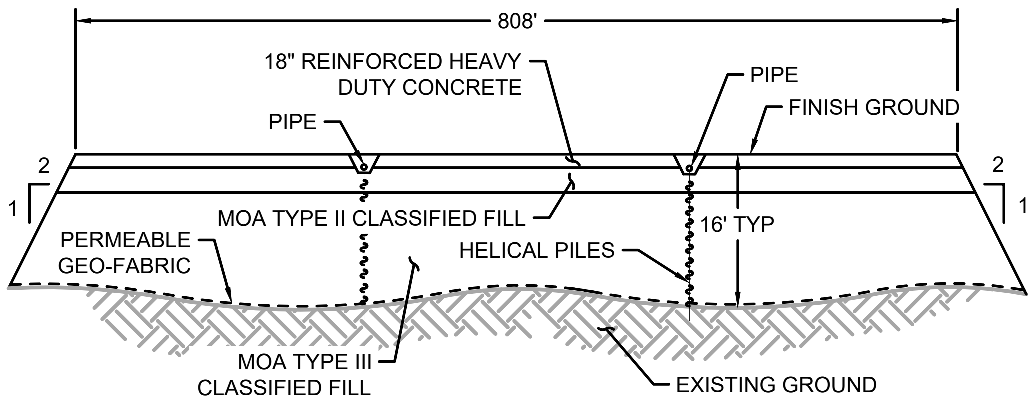
|---|---|
| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

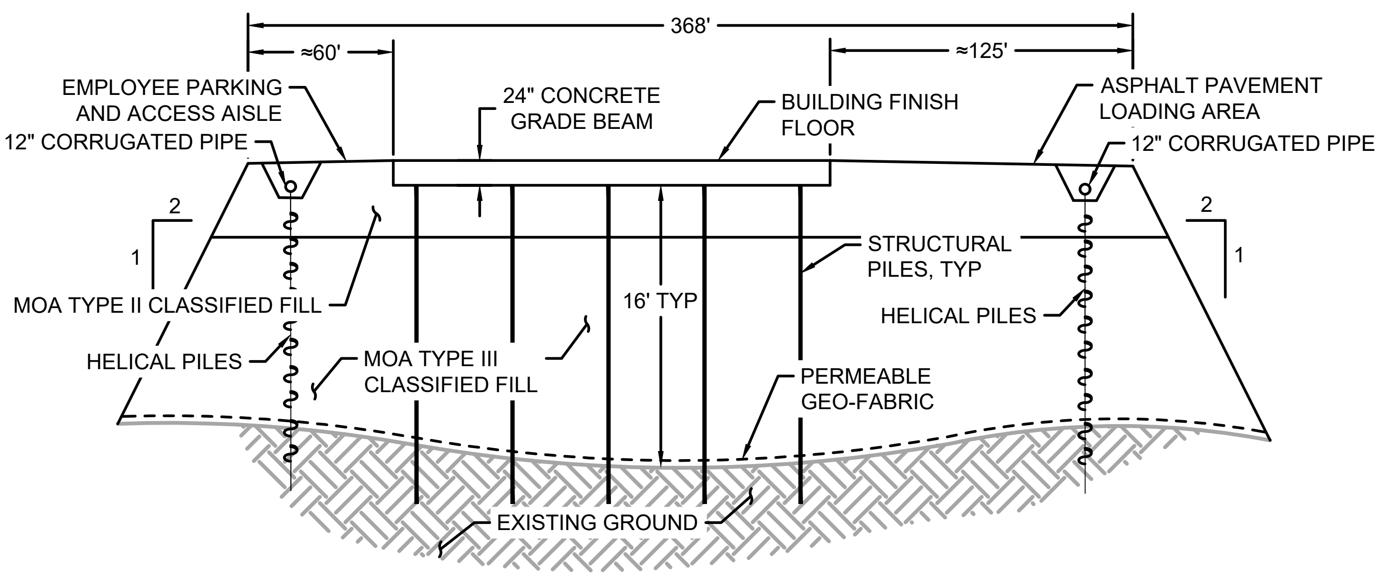
SHEET 3 of 7




1
3.0

## TYPICAL SECTION - HARDSTANDS

NTS




2
3.0

## TYPICAL SECTION - BUILDING

NTS

NOTES:

1. GEOFABRIC MATERIAL PLACED DIRECTLY OVER ORIGINAL GROUND PRIOR TO GRAVEL PLACEMENT.
2. ALL GRAVEL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12".
3. ALL GRAVEL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY.

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ALASKA CARGO & COLD STORAGE WAREHOUSE
TYPICAL SECTION

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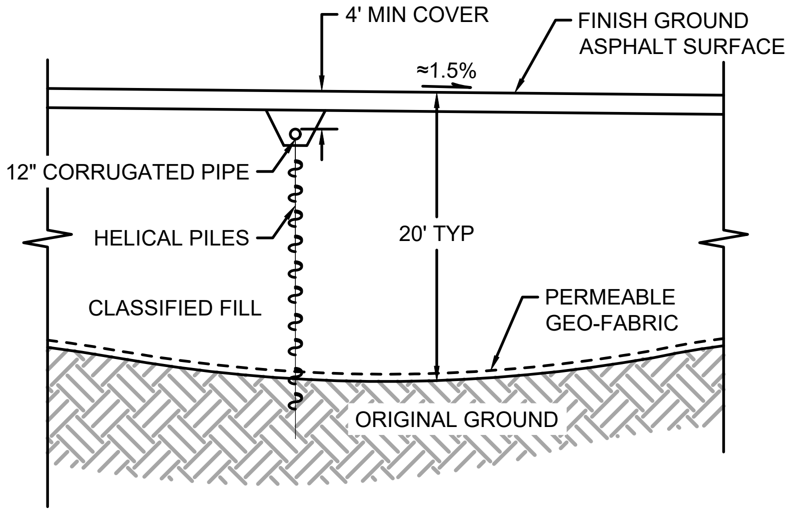
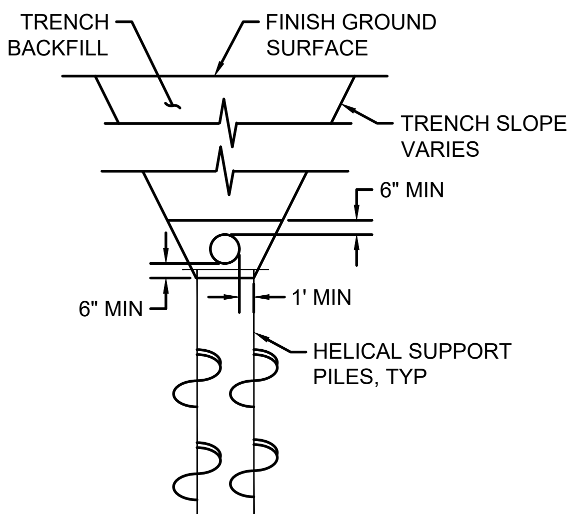
|---|---|
| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

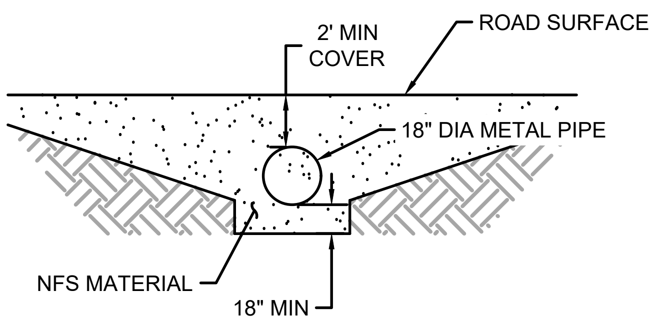
SHEET 4 of 7




## DETAIL - TYPICAL PAVED ACCESS ROAD
NTS




## DETAIL - TRENCH CONSTRUCTION FOR UTILITIES
NTS




NOTES:
1. 18" DIAMETER LINES STEEL OR CORRUGATED METAL PIPE MAY BE USED.
2. FLARES SHALL BE INSTALLED AT THE INLET AND OUTLET OF THE PIPE.
3. ALL FILL MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY.

## DETAIL - TYPICAL CULVERT
NTS

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ALASKA CARGO & COLD STORAGE
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TYPICAL SECTION

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| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

SHEET 5 of 7

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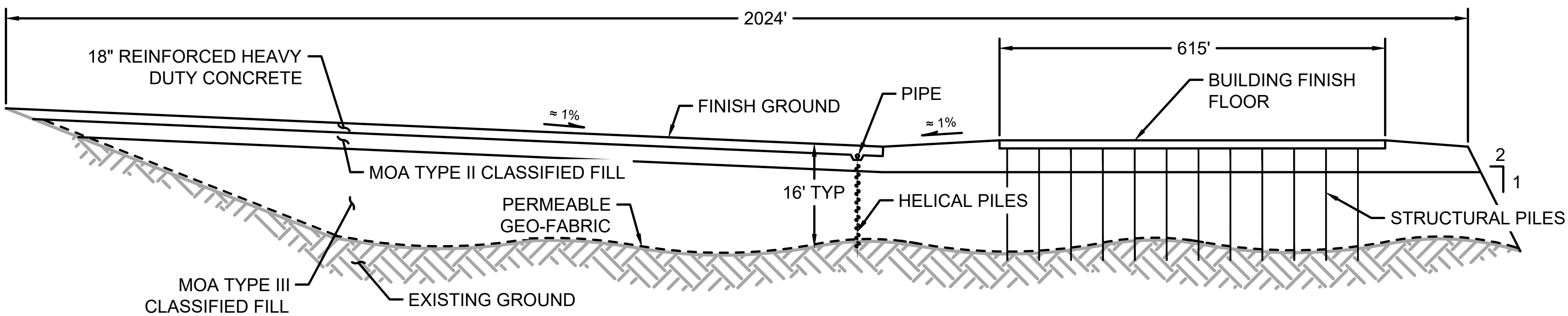


1 / 3.2 TYPICAL SECTION
NTS

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ALASKA CARGO & COLD STORAGE
WAREHOUSE
TYPICAL SECTION

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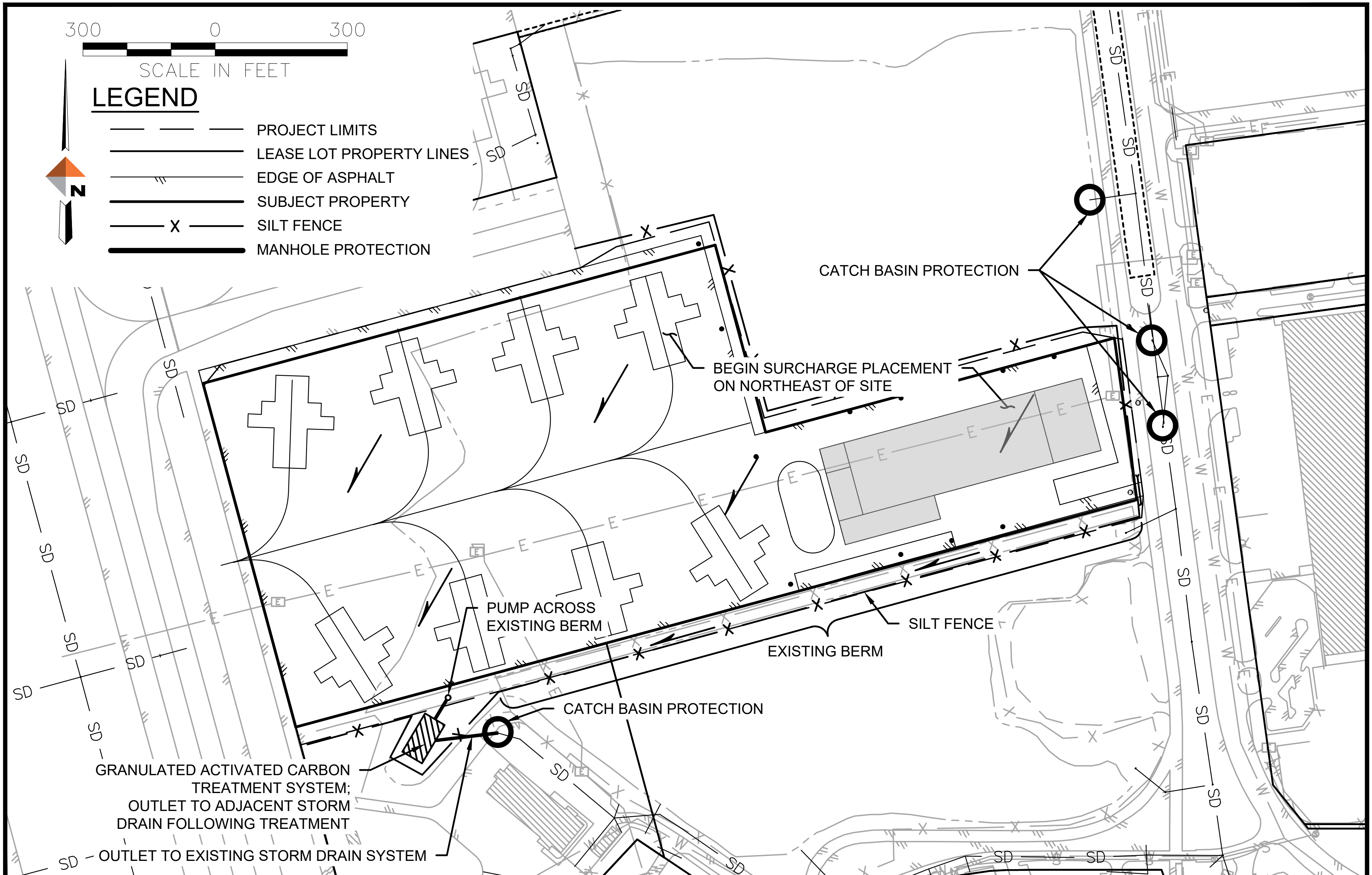
|---|---|
| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

SHEET 6 of 7

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ALASKA CARGO & COLD STORAGE
WAREHOUSE
BMP PLAN

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|---|---|
| PROJECT | POA-2021-00121 |
| | KNIK ARM |
| DATE | 06/17/2022 |

FIGURE 7 of 7

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

# Department of Environmental Conservation
DIVISION OF WATER
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, Alaska 99501-2617
Main: 907.269.6285
Fax: 907.334.2415
www.dec.alaska.gov/water/wastewater

June 29, 2023

Alaska Cargo and Cold Storage
Attn: Rob Gilliam
P.O. Box 19696, Anchorage AK 99519

Re: Alaska Cargo and Cold Storage Facility
POA-2021-00121 v1.0, Cook Inlet - Knik Arm

Dear Rob Gilliam,

In accordance with Section 401 of the Federal Clean Water Act of 1977 and provisions of the Alaska Water Quality Standards, the Department of Environmental Conservation (DEC) is issuing the enclosed water quality certification that the discharge from the proposed project will comply with water quality requirements for the placement of dredged and/or fill material in waters of the U.S., including wetlands and streams, associated with the proposed project: *Alaska Cargo and Cold Storage Facility*.

A person authorized under a provision of 18 AAC 15 may request an informal review of a contested decision by the Division Director in accordance with 18 AAC 15.185 and/or an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340. See DEC's "Appeal a DEC Decision" web page https://dec.alaska.gov/commish/review-guidance/ for access to the required forms and guidance on the appeal process. Please provide a courtesy copy of the adjudicatory hearing request in an electronic format to the parties required to be served under 18 AAC 15.200.

By copy of this letter we are advising the U.S. Army Corps of Engineers of our actions and enclosing a copy of the certification for their use.

Sincerely,

James Rypkema
Program Manager, Storm Water and Wetlands

Enclosure: 401 Water Quality Certificate

cc: (with encl.)
Roberta Budnik, USACE
Agent, Jason Gamache, MCG Explore Design
Craig Campbell, TSAIA
Rob Gilliam, AK Cargo & Cold Storage
Megan Marie, ADF&G;
USFWS Field Office Anchorage;
Matthew LaCroix, EPA AK Operations

# STATE OF ALASKA
# DEPARTMENT OF ENVIRONMENTAL CONSERVATION
## Water Quality Certification

In accordance with Section 401 of the Federal Clean Water Act (CWA) and the Alaska Water Quality Standards (18 AAC 70), a water quality certification is issued to the AK Cargo and Cold Storage, Attn: Rob Gilliam, P.O. Box 19696, Anchorage AK 99519 that the discharge from the proposed project *Alaska Cargo and Cold Storage Facility* will comply with water quality requirements for the placement of dredged and/or fill material in waters of the U.S. including wetlands and streams.

A state issued water quality certification is required under Section 401 because the proposed activity will be authorized by a U.S. Army Corps of Engineers permit POA-2021-00121 and a discharge of pollutants to waters of the U.S. located in the State of Alaska may result from the proposed activity. Public notice of the application for this certification was given as required by 18 AAC 15.180 in the DEC Public Notice POA-2021-00121 posted from July 14, 2022 to August 15, 2022.

### Project Purpose, Description, and Location

Project Purpose: The applicant's stated purpose is to construct an energy-efficient cargo transfer and cold storage facility at Ted Stevens Anchorage International Airport to help improve Alaska's supply chain disruptions, protect Alaska's food security, and build Alaska's economy.

Project Description: The applicant proposes to discharge up to 653,022 cubic yards of fill material (concrete, asphalt, base course, MOA Type II, Type III) into a total of 21.6 acres of wetlands to construct a new, 29-acre concrete pad to support a cargo storage facility building, airside and landside loading areas, outdoor storage, vehicle parking, eight (8) hardstands for aircraft parking, and emergency and maintenance vehicle access around the building.

Location: Located on approximately 29 acres of land within Section 28, Township 13N, Range 4W, Seward Meridian; U.S. Geological Survey (USGS) Quad Anchorage A-8 NW. Latitude, Longitude: 61.185298, -149.993582.

Pursuant to the Department's Antidegradation Policy and Implementation Methods at 18 AAC 70.015 and 18 AAC 70.016, DEC finds that the project would comply with the requirements for Tiers 1 and 2 regarding water quality impacts to receiving water immediately surrounding the dredge or fill material pursuant to the Corps evaluation and findings of no significant degradation under 33 U.S.C. 1344 and under 40 CFR 230. The use of appropriate best management practices and erosion and sediment control measures would adequately protect the existing water uses and the level of water quality necessary to protect existing uses. Any potential water quality degradation is expected to be temporary and limited and necessary to accommodate important social and/or economic development in the area.

### Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

The Department of Environmental Conservation (DEC) reviewed the application and certifies that there is reasonable assurance that the proposed activity, as well as any discharge which may result, will comply with applicable provisions of Section 401 of the CWA and the Alaska Water Quality Standards, 18 AAC 70 provided that the following additional measures are adhered to.

Pursuant to 18 AAC 70.020(a) and the Toxics and Other Deleterious Organic and Inorganic Substances in 18 AAC 70.020(b), the following conditions are designed to reduce pollutants from construction activity to ensure compliance with the applicable water quality standards.

### *Pollutants/Toxics*

1. Fuel storage and handling activities for equipment must be sited and conducted so there is no petroleum contamination of the ground, subsurface, or surface waterbodies.
2. During construction, spill response equipment and supplies such as sorbent pads shall be available and used immediately to contain and cleanup oil, fuel, hydraulic fluid, antifreeze, or other pollutant spills. Any spill amount must be reported in accordance with Discharge Notification and Reporting Requirements (AS 46.03.755 and 18 AAC 75 Article 3). The applicant must contact by telephone the DEC Area Response Team for Southeast Alaska 907-465-5340 during work hours or 1-800-478-9300 after hours. Also, the applicant must contact by telephone the National Response Center at 1-800-424-8802.
3. Construction equipment shall not be operated below the ordinary high-water mark if equipment is leaking fuel, oil, hydraulic fluid, or any other hazardous material. Equipment shall be inspected daily for leaks. If leaks are found, the equipment shall not be used and pulled from service until the leak is repaired.
4. Fill material (including dredge material) must be clean soil, sand, gravel or rock, free from petroleum products and toxic contaminants in toxic amounts.
5. The applicant shall prepare and obtain approval from DEC (Sam Kito, 907-269-7542, sam.kito@alaska.gov) of an Environmental Management Plan (EMP) for handling potentially contaminated soil, groundwater, and surface water that may be encountered during construction of the proposed facility.

### *Turbidity, Erosion and Sediment Control*

6. Runoff discharged to surface water (including wetlands) from a construction site disturbing one or more acres must be covered under Alaska's General Permit for Storm Water Discharges from Large and Small Construction Activities in Alaska (CGP, AKR100000, 18 AAC 83). The CGP requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For projects that disturb more than five acres, this SWPPP must also be submitted to DEC prior to construction along with the Notice of Intent (NOI). For more information see DEC's website for the CGP at http://dec.alaska.gov/water/wastewater/stormwater/construction, or call 907-269-6285.
7. Excavated or fill material, including overburden, shall be placed so that it is stable, meaning after placement the material does not show signs of excessive erosion. Indicators of excess erosion include gullying, head cutting, caving, block slippage, material sloughing, etc. The material must be contained with siltation best management practices (BMPs) to preclude reentry into any waters of the U.S., which includes wetlands.
8. Include the following BMPs to handle storm water and total storm water volume discharges as they apply to the site:
   a. Divert storm water from off-site around the site so that it does not flow onto the project site and cause erosion of exposed soils;
   b. Slow down or contain storm water that may collect and concentrate within a site and cause erosion of exposed soils;
   c. Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

9. The permittee must stabilize any dredged material (temporarily or permanently) stored on upland property to prevent erosion and subsequent sedimentation into jurisdictional waters of the United States. The material must be contained with siltation control measures to preclude reentry into any waters of the U.S., including wetlands.

### *Vegetation Protection and Restoration*

10. Any disturbed ground and exposed soil not covered with fill must be stabilized and re-vegetated with endemic species, grasses, or other suitable vegetation in an appropriate manner to minimize erosion and sedimentation, so that a durable vegetative cover is established in a timely manner.
11. All work areas, material access routes, and surrounding wetlands involved in the construction project shall be clearly delineated and marked in such a way that equipment operators do not operate outside of the marked areas.
12. Natural drainage patterns shall be maintained, to the extent practicable, without introducing ponding or drying.

### *General*

13. DEC coordinates with several regulatory programs to review the impacts of proposed projects. A Section 401 Certification does not release the applicant from obtaining all necessary federal, state, and local permits, nor does it limit more restrictive requirements set through any such program. It does not eliminate, waive, or vary the applicant's obligation to comply with all state water statutes and rules through construction, installation, and operation of the project or mitigation, including, but not limited to the APDES permitting program 18 AAC 83 and 18 AAC 72.
14. USACE has stated that projects shall be reviewed under the federal rules in place at the time the application is received. This project and its mitigation were reviewed under the federal and state statutes and laws in place at the time the application was received. If the USACE determines any part or condition of this Certification is not lawful or is waived and unenforceable, the determination shall apply only to the part or condition so determined. The determination shall not apply to nor invalidate any remaining parts or conditions of this Certification. If the USACE makes such a determination, the applicant remains responsible for meeting state water quality statutes and rules, and if a violation occurs, may be subject to state enforcement (18 AAC 70.010).
15. This Certification does not release the applicant from any liability, penalty, or duty imposed by Alaska or federal statutes, regulations, rules or local ordinances, and it does not convey a property right or an exclusive privilege.
16. If your project is not completed by the time limit specified under USACE Permit and will continue, or for a modification of the USACE permit, you must submit an application for renewal of this certification at least 60 days before the expiration date or any deadline established by USACE for certification action on the modification, or 60 days before the proposed effective date of the modification, whichever is sooner. (18 AAC 15.120(b), 18 AAC 15.130, 18 AAC 15.180).

Date: June 29, 2023

James Rypkema, Program Manager
Storm Water and Wetlands

US Army Corps
of Engineers ®
Alaska District

| CREDIT PURCHASE RECEIPT | |
|---|---|
| **Compensatory Mitigation Type: Mitigation Bank ( n/a ) In-Lieu-Fee Program ( n/a )** | |
| **Credit Provider: TSAIA** | |
| **Service Area or Name of Mitigation Site: Klatt Bog Wetland Mitigation Credits** | |
| **Permit Number: POA-2021-00121** | **USACE Project Manager: Roberta Budnik** |
| **Project: AK Cargo & Cold Storage Facility at TSAIA** | **Waterway: Knik Arm** |
| **Impact Site Location: 61.1840, -149.9940** | |
| **MITIGATION REQUIREMENT** | |
| Marine/Estuarine | 0.00 |
| Palustrine | 9.28 |
| Riverine/Stream | 0.00 |
| Lacustrine | 0.00 |
| **TOTAL MITIGATION REQUIREMENT** | **9.28** |
| **CREDITS PURCHASED** | |
| **Credit Type** | **Number of Credits** |
| Marine/Estuarine | |
| Palustrine | |
| Riverine/Stream | |
| Lacustrine | |
| **TOTAL CREDITS PURCHASED** | |

Alaska Cargo & Colds Storage
Ted Stevens Anchorage International Airport — Date

(Name) Date
TSAIA - Klatt Bog Wetland Mitigation Credits
Representative

US Army Corps of Engineers ®
Alaska District

| CREDIT PURCHASE RECEIPT | |
|---|---|
| Compensatory Mitigation Type: Mitigation Bank ( X ) In-Lieu-Fee Program ( ) | |
| Credit Provider: Harmany Ranch Wetland Mitigation Bank | |
| Service Area or Name of Mitigation Site: | |
| Permit Number: POA-2021-00121 | USACE Project Manager: Roberta Budnik |
| Project: AK Cargo & Cold Storage Facility at TSAIA | Waterway: Knik Arm |
| Impact Site Location: 61.1840, -149.9940 | |
| **MITIGATION REQUIREMENT** | |
| Marine/Estuarine | 0.00 |
| Palustrine | 14.685 |
| Riverine/Stream | 0.00 |
| Lacustrine | 0.00 |
| **TOTAL MITIGATION REQUIREMENT** | **14.685** |
| **CREDITS PURCHASED** | |
| **Credit Type** | **Number of Credits** |
| Marine/Estuarine | |
| Palustrine | |
| Riverine/Stream | |
| Lacustrine | |
| **TOTAL CREDITS PURCHASED** | |

Alaska Cargo & Cold Storage
Ted Stevens Anchorage International Airport

Date

(Name)
Harmany Ranch Wetland Mitigation Bank
Representative

Date

# AS-BUILT CERTIFICATION BY PROFESSIONAL ENGINEER

*Submit this form and one set of as-built engineering drawings to the U.S. Army Corps of Engineers, at regpagemaster@usace.army.mil and roberta.k.budnik@usace.army.mil. If you have questions regarding this requirement, please contact the U.S. Army Corps of Engineers at 907-753-2712.*

1. Department of the Army Permit Number: POA-2021-00121

2. Permittee Information:

Name: Alaska Cargo & Cold Storage
Ted Stevens Anchorage International Airport

Address: ______________________________

______________________________

3. Project Site Identification (physical location/address):

______________________________

______________________________

______________________________

4. As-Built Certification: I hereby certify that the authorized work, including any mitigation required by Special Conditions to the permit, has been accomplished in accordance with the Department of the Army permit with any deviations noted on the next page. This determination is based upon on-site observation, scheduled, and conducted by me or by a project representative under my direct supervision. I have enclosed one set of as-built engineering drawings.

______________________________ Signature of Engineer

______________________________ Name (*Please type*)

______________________________ Reg. Number

______________________________ Company Name

______________________________ City

______________________________ State

______________________________ ZIP

(Affix Seal)

______________________________ Date

______________________________ Telephone Number

Identify any deviations from the approved permit drawings and/or special conditions (attach additional pages if necessary):

| NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL | | |
|---|---|---|
| Applicant: Alaska Cargo & Cold Storage, LLC<br>Ted Stevens Anchorage International Airport | File Number: POA-2021-00121 | Date: 6/30/2023 |

| Attached is: | | See Section below |
|---|---|---|
| X | INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission) | A |
| | PROFFERED PERMIT (Standard Permit or Letter of permission) | B |
| | PERMIT DENIAL | C |
| | APPROVED JURISDICTIONAL DETERMINATION | D |
| | PRELIMINARY JURISDICTIONAL DETERMINATION | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

## POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

| If you have questions regarding this decision and/or the appeal process you may contact: | If you only have questions regarding the appeal process you may also contact: |
|---|---|
| Roberta K. Budnik<br>Alaska District Corps of Engineers<br>CEPOA-RD-S<br>P.O. Box 6898<br>JBER, AK 99506-0898<br>(907) 753-2785 | Ms. Kate Bliss<br>Regulatory Program Manager<br>U.S. Army Corps of Engineers, Pacific Ocean Division<br>CEPOD-PDC, Bldg 525<br>Fort Shafter, HI 96858-5440<br>(808) 835-4626<br>kate.m.bliss@usace.army.mil |

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

| ______________________________<br>Signature of appellant or agent. | Date: | Telephone number: |
|---|---|---|

**MEMORANDUM FOR RECORD**

**SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for the Above-Referenced Standard Individual Permit Application**

This document constitutes the Environmental Assessment, Section 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings for the subject application.

## 1.0 Introduction and Overview

Information about the proposal subject to one or more of the United States Army Corps of Engineers' (Corps') regulatory authorities is provided in Section 1, detailed evaluation of the activity is found in Sections 2 through 11 and findings are documented in Section 12 of this memorandum. Further, summary information about the activity including administrative history of actions taken during project evaluation is attached (ORM2 Summary) and incorporated in this memorandum.

### 1.1 Applicant name

Ted Stevens Anchorage International Airport (TSAIA) and Alaska Cargo and Cold Storage, LLC

### 1.2 Activity location

Latitude 61.1840º N., Longitude 149.9940º W.; Ted Stevens Anchorage International Airport (TSAIA), Anchorage, Alaska.

### 1.3 Description of activity requiring permit

Discharge up to 653,022 cubic yards of fill material (concrete, asphalt, base course, MOA Type II, Type III) into a total of 21.6 acres of wetlands to construct a new, 29-acre concrete pad to support a cargo storage facility building, airside and landside loading areas, outdoor storage, vehicle parking, eight (8) hardstands for aircraft parking, and emergency and maintenance vehicle access around the building.

#### 1.3.1 Proposed avoidance and minimization measures

<u>Avoidance</u>: Complete avoidance of impacts to wetlands is not possible to meet the proposed project's purpose and need as much of the parcel consists of wetlands. <u>Minimization</u>: The size of the facility is necessary to help meet the demand for various storage types (cold, heated, and general) as well as equipment and aircraft staging and storage. The footprint of the pad has been minimized by decreasing the pad and driveway side slopes. Typical construction Best Management Procedures (BMPs) would be implemented, and a Contaminated Material Management Plan (CMMP) approved by the Alaska Department of Environmental Conservation (ADEC) would be implemented.

### 1.3.2 Proposed compensatory mitigation

Under the Anchorage Debit/Credit Methodology (ADCM), about 9.9 debits are expected to result from the proposed project. TSAIA holds 17.84 compensatory mitigation credits that remain from their Klatt Bog wetland mitigation and the applicants propose using 9.28 of the available credits as mitigation for the proposed project. The remainder of the Klatt Bog mitigation credits would be utilized by TSAIA to offset impacts resulting from a separate project (POA-2021-00209). See section 8.0 for more information regarding proposed and required compensatory mitigation.

### 1.4 Existing conditions and any applicable project history

The proposed project area is known to have per- and polyfluoroalkyl substances (PFAS) contamination. PFAS are a group of man-made chemicals used in many industries since the 1940s. They are found in certain types of firefighting foams, which are used to extinguish fuel and chemical fires. PFAS were used throughout TSAIA during fire-fighting drills before it was known that they cause significant adverse health and environmental impacts. PFAS can accumulate and stay in environments for long periods of time and have significant human health effects. According to a 2019 site investigation that included soil sampling at the proposed project site, PFAS-type chemicals, Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS), exceed ADEC cleanup levels at the site. Additionally, petroleum hydrocarbon levels exceed ADEC cleanup levels at the site (ADEC file number: 2100.38.028.39).

During a 2019 site investigation, Gasoline Range Organics (GRO), Diesel Range Organics (DRO), Residual Range Organics (RRO), and Toluene were detected in soil samples. While GRO and Toluene were either non-detectable or below ADEC Method 2 Migration to Groundwater (MTG) cleanup levels, RRO exceeded ADEC Method 2 MTG cleanup levels, and DRO exceeded the ADEC Method 2 Maximum Allowable Concentration. To avoid handling and disposing of contaminated soils, the project does not propose to excavate and remove material from the site. Minor quantities of material that would be removed from utility tie-ins or other small areas would be replaced in the trench or as close to the source as possible.

Because the site is completely surrounded by fill, PFAS, GRO, and RRO-contaminated water created following the placement of surcharge (fill) material would be captured and treated before exiting the site via the existing storm drain system pending permitting by ADEC and/or Anchorage Water Wastewater Utility (AWWU). Surcharge material placement would begin on the northeast corner of the project area. Flow offsite to the northeast would be blocked by this material. Water would be blocked from flowing to the south by an existing berm that runs east-west across the entire project area. Water will be directed southwest toward the existing berm. Water would be collected in the southwest corner and pumped across the existing berm to be treated in an existing containment area surrounded by existing fill. Contaminated water would be treated via Granular Activated Carbon (GAC) prior to discharge to the storm drain system. A silt fence would be installed around the entire surcharged area.

1.4.1 Jurisdictional Determination

Is this project supported by a jurisdictional determination? Yes, an Approved Jurisdictional Determination (AJD) was completed on May 25, 2021. At this time, the Navigable Waters Protection Rule (NWPR) was in effect and the wetlands were found to be jurisdictional adjacent wetlands. The wetlands in the review area were found to have a direct hydrologic surface connection through emergent wetlands which convey flow through a culvert and drainpipe that discharges directly into Knik Arm, a traditional navigable water. The NWPR has since been remanded and the pre-2015 definition of waters of the U.S. (WOTUS) is currently in effect. A new AJD was not requested by the applicant after the rule change.

1.5 Permit authority

| **Table 1 – Permit Authority** | |
|---|---|
| Section 10 of the Rivers and Harbors Act (33 USC 403) | |
| Section 404 of the Clean Water Act (33 USC 1344) | X |
| Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 USC 1413) | |

## 2.0 Scope of review for National Environmental Policy Act (i.e., scope of analysis), Section 7 of the Endangered Species Act (i.e., action area), and Section 106 of the National Historic Preservation Act (i.e., permit area)

2.1 Determination of scope of analysis for National Environmental Policy Act (NEPA)

The scope of analysis always includes the specific activity requiring a Department of the Army permit that is located within the Corps' geographic jurisdiction. In addition, we have applied the four factors test found in 33 CFR Part 325, Appendix B to determine if there are portions of the larger project beyond the limits of the Corps' geographic jurisdiction where the federal involvement is sufficient to turn these portions of an essentially private action into a federal action.

Based on our application of the guidance in Appendix B, we have determined that the scope of analysis for this review includes the Corps geographic jurisdiction and upland portions beyond the Corps geographic jurisdiction.

These upland components include the portion of the proposed fill pad which spans the existing uplands adjacent to the wetlands which are proposed to be impacted. These components have been determined to be within our scope of analysis as the extent of federal involvement is sufficient to turn these portions of an essentially private action into a federal action with the resulting environmental consequences of the larger project essentially being products of the Corps' permit action.

Final description of scope of analysis: The scope of analysis under NEPA has been determined to include the entire project, including the upland portions. The proposed project would create one large pad over a 32.7-acre area, of which 21.6 acres are wetlands proposed to be filled. That leaves a remaining 11.1 acres of uplands which would also be disturbed by the proposed project. The proposed project would not be complete without the upland portion and vice versa. As a majority of the proposed project requires a federal action, there is sufficient federal control and responsibility to expand the NEPA scope of analysis over those portions which are outside of the Corps' jurisdiction.

2.2 Determination of the Corps' action area for Section 7 of the Endangered Species Act (ESA)

The action area for Section 7 of the ESA includes all areas in which direct and indirect impacts caused by the proposed project could be perceived by a listed species.

2.3 Determination of Corps' permit area for Section 106 of the National Historic Preservation Act (NHPA)

The permit area includes those areas comprising waters of the United States that will be directly affected by the proposed work or structures, as well as activities outside of waters of the U.S. because all three tests identified in 33 CFR 325, Appendix C(g)(1) have been met.

Final description of the permit area: The permit area for Section 106 of the NHPA includes both the upland and wetland areas of the proposed project. The upland portion of the proposed project (1) would not occur but for authorization of impacts to the wetlands, (2) is integrally related to the wetland portion of the proposed project, and (3) is directly associated with the wetland portion of the proposed project.

**3.0 Purpose and Need**

3.1 Project purpose and need

Project purpose and need for the project as provided by the applicant and reviewed by the Corps:

The applicant's stated purpose is to construct an energy-efficient cargo transfer and cold storage facility at TSAIA to help improve Alaska's supply chain disruptions, to protect Alaska's food security, and build Alaska's economy. The project would provide a facility for goods from outside Alaska to be stored prior to moving to Alaskan communities. The project would grow Alaska's economy by providing a much-needed climate-controlled facility for goods being transferred at and exported from the state. The project would be the first leasable facility in Alaska available to major air cargo carriers, which do not have the individual capacity to support the development of a facility of this size.

3.2 Basic project purpose

Basic project purpose, as determined by the Corps: To construct a storage and transfer facility.

3.3 Water dependency determination

The proposed project does not require access to, proximity to, or siting within a special aquatic site to fulfil the basic project purpose, and therefore is not water dependent (40 CFR 230.10(a)(3)).

3.4 Overall project purpose

Overall project purpose, as determined by the Corps:

The overall project purpose is to construct a storage and transfer facility for use by major air cargo carriers and capable of supporting Alaska's supply chain of food and other goods.

## 4.0 Coordination

4.1 Public Notice Results

The results of coordinating the proposal on public notice are identified below, including a summary of issues raised, any applicant response and the Corps' evaluation of concerns.

Were comments received in response to the public notice? Yes.

Were comments forwarded to the applicant for response? Yes, comments were forwarded to the applicant in a letter transmitted via email on August 24, 2022.

Was a public meeting and/or hearing requested, and if so, was one conducted?

No, no public hearing or meeting was requested.

Comments received in response to public notice:

Comment 1: The National Marine Fisheries Service (NMFS) submitted comments in a letter dated August 2, 2022. NMFS offered the following comments:

- "Endangered fin whales, endangered Western North Pacific Distinct Population Segment (DPS) humpback whales, threatened Mexico DPS humpback whales, endangered Cook Inlet beluga whales, and endangered Western DPS Steller sea lions occur in Cook Inlet. In particular, the Cook Inlet beluga whale frequently occurs in the shallow coastal waters of the upper inlet including Knik Arm, where critical habitat has been designated…One of the principal sources of anthropogenic toxicants in the marine environment is discharges and runoff from urban areas. Discharges of pollutants into Cook Inlet may impair water quality and adversely affect beluga whales. Perfluoronated compounds have been identified as emerging substances of concern for the Cook Inlet beluga population and could potentially cause endocrine disruption, reproductive disorders, and other adverse effects. These compounds are persistent and known to bioaccumulate in marine mammals.

"Beluga prey species could also be impacted by contaminants released into Cook Inlet…potential reduction in quantity and quality of prey species could result in decreased rates of beluga reproduction and of survivorship by reducing individual condition or fitness, or habitat displacement from loss of prey availability. Possible contamination of food sources would likely be localized to the discharge areas; however, tissue contamination levels increase with multiple exposures to contaminated prey.

"To minimize potential direct and indirect adverse effects to Cook Inlet beluga whales and their critical habitat…a rigorous clean-up and water quality testing plan must be implemented."

Applicant's Response: In response, the applicant has stated that they have engaged the resources of "Regenesis" which is a firm that specializes in Airport Remediation projects and will be developing a plan for water treatment complementary to the adjacent project (POA-2021-00209, FedEx). Treatment/remediation would occur in coordination with the neighbor.

Corps' Evaluation: The applicant has sufficiently addressed the NMFS's comments. The proposed project would be required to have a Clean Water Act Section 401 Water Quality Certification (WQC), as well as an approved CMMP from ADEC. The proposed project would not be permittable by the Corps without a plan to ensure the water surcharged from the impacted wetlands is remediated and contaminants removed/captured. Currently, untreated water flows directly from the wetlands in the proposed project area through a pipe under North Tug Road, and discharges directly into Knik Arm. The Corps is unaware of any efforts to remediate the water without the proposed development. Therefore, it would be expected that as a result of the proposed project, water from the wetland discharging directly into Knik Arm would have less or be free from contaminants.

Comment 2: Ms. Cathy Gleason, an individual, submitted comments in a letter dated August 10, 2022, via email. Ms. Gleason offered the following comments (note italicized text is italicized in the original comments):

- Ms. Gleason attached comments from the Turnagain Community Council (TCC) provided to the Airport Leasing Program Manager about the applicant's lease application.

- "It is critical that the Corps require mitigation commiserate [sic] to *cumulative* impacts resulting from filling 21.6 acres of Postmark Bog for this project – in addition to the adjacent Postmark Bog wetlands that will be filled, if the proposed FedEx expansion development is permitted." Ms. Gleason noted that Postmark

Bog is classified as a “Class A” wetland by the Anchorage Wetland Management Plan (AWMP), and that the authorization of these two projects would fill the “…last remaining acreage of Postmark Bog.”

- In addition to the use of TSAIA’s Klatt Bog credits, “…preservation of a portion of Turnagain Bog wetlands located within TSAIA should be included in the mitigation requirement for this project…” Ms. Gleason noted that the location and acreage of such should be determined with TSAIA and TCC collaboration.

- “…the *destruction of the remaining portions of Postmark Bog* – as well as increasing *cumulative* impacts in the Turnagain neighborhood – merits serious consideration of onsite mitigation protection of Class A wetlands in Turnagain Bog.” Ms. Gleason noted that this would help to address long-standing concerns by TCC regarding water quality and hydrology of the waterbodies located within TSAIA and the Turnagain neighborhood. She stated that the presence of PFAS and other hazardous pollutants threatens the health and safety of Turnagain residents and that the Turnagain Bog wetlands play a critical role in the continued long-term protection of their neighborhood.

- “Exposure…of jet fumes generated by large cargo operations…is another continuing and *cumulative* impact that will only increase with the proposed…” project. “Turnagain Bog wetlands and associated wooded uplands…provide important buffering and absorption of this highly-toxic impact.” She stated that preservation of Turnagain Bog wetlands/uplands as compensatory mitigation for this and other cargo-related development projects is “…essential to ensure these important functions will be in place long-term…”

- “To help mitigate existing, substantial ground noise…TCC has requested that TSAIA…integrate the placement of a large evergreen-landscaped noise berm running along the eastern boundaries of both proposed developments [the proposed project and FedEx proposed project].” Ms. Gleason requested the Corps take into consideration this request as “…part of proposed facility development mitigation at Postmark Bog.”

- The proposed project would generate “…large, heavy truck traffic traveling on West Northern Lights Blvd. through the residential area of Turnagain to access this area.” Ms. Gleason listed the following impacts from such traffic, including air pollution from exhaust, constant truck noise, vibration of homes from truck traffic, deterioration of West Northern Lights Blvd., and safety risks to pedestrians using the sidewalk and multi-use running trail and crosswalk. Ms. Gleason stated that the Corps needs to take into consideration, “…the dangerous and highly inappropriate use of WNL [West Northern Lights Blvd.] – as a result of increasing wetland fill/development/operations in North Airpark by cargo-generated truck traffic.”

Applicant Response: In response to Ms. Gleason's comments regarding cumulative impacts to Postmark Bog, the applicant rebuts that the location of the wetlands to be impacted is surrounded on all sides by manmade impervious surfaces, that water from the wetlands flows north to "outfall D," and that the proposed project would not impact existing wetlands to the east of Postmark Drive. The applicant also states that the intent to preserve wetlands is to preserve bird habitat, but that bird habitat adjacent to aircraft operations is a public life safety issue and is actively managed by TSAIA to keep birds away from the airport. The applicant also pointed out that due to the water contamination, birds would be poisoned if they used the wetlands.

In response to Ms. Gleason's comments regarding her assertion that a portion of Turnagain Bog located within TSAIA should be included in the mitigation requirement in addition to the use of TSAIA's Klatt Bog credits, the applicant restated that the proposed project would not impact the wetlands to the east of Postmark Drive.

In response to Ms. Gleason's comments regarding water quality/pollution and hydrology, the applicant stated that they would be implementing a remediation plan to treat the existing contamination on site.

In response to Ms. Gleason's comments regarding air quality/jet fume exposure and noise impacts, the applicant stated that they would take air quality into consideration during site design, as well as ways to reduce ground noise. The applicant stated they may design buildings to absorb sound, as well as the installation of ground power to reduce the need for generators and aircraft engine idling. The applicant stated that they will also consider the use of electric vehicles.

In response to Ms. Gleason's comment regarding heavy truck traffic on West Northern Lights Blvd., the applicant stated that the proposed project's intent is to service air to air cargo transfer, which would eliminate the need for road transport. The proposed project would not produce delivery truck traffic. However, if trucks are required to come to and from the site, they would be routed to International Airport Road.

Corps Evaluation: The applicant has sufficiently addressed Ms. Gleason's comments. Cumulative impacts for the proposed project are evaluated in section 9.0 of this document. Compensatory mitigation requirements are evaluated in section 8.0. The Corps can only require that adequate and appropriate compensatory mitigation be completed but cannot direct the any applicant to provide any specific compensatory mitigation. The applicant must provide a compensatory mitigation proposal to the Corps, and the Corps must evaluate the proposal for sufficiency. Therefore, the Corps cannot require that the applicant preserve a portion of the Turnagain Bog wetlands as a part of their compensatory mitigation requirements. If the applicant were to propose that as a part of their compensatory mitigation plan, the Corps would evaluate that proposal for sufficiency in offsetting the proposed project's unavoidable impacts to waters of the U.S., including wetlands. Impacts to water quality is discussed in sections 6.0 and 7.0 of this document, and information regarding the state's WQC and approved remediation plan is within section 10.5. Clean Air Act compliance is discussed in section 7.5 of this document. Aesthetics, including noise, is discussed in section 6.0 and 7.0 of this document.

Additional discussion of submitted comments, applicant response and/or Corps' evaluation: N/A

4.2 Additional issues raised by the Corps

N/A

4.3 Comments regarding activities and/or effects outside of the Corps' scope of review

Ms. Gleason commented on the potential for heavy trucks to use West Northern Lights Blvd., however the Corps has no authority to regulate traffic routes which may result from the proposed project's completion.

## 5.0 Alternatives Analysis

(33 CFR Part 325 Appendix B, 40 CFR 230.5(c), 40 CFR 1501, and RGL 88-13). An evaluation of alternatives is required under NEPA for all jurisdictional activities. NEPA requires discussion of a reasonable range of alternatives, including the no action alternative, and the effects of those alternatives. An evaluation of alternatives is required under the Section 404(b)(1) Guidelines for projects that include the discharge of dredged or fill material to waters of the United States. Under the Section 404(b)(1) Guidelines, practicability of alternatives is taken into consideration and no alternative may be permitted if there is a less environmentally damaging practicable alternative.

5.1 Site selection/screening criteria

In order to be practicable, an alternative must be available, achieve the overall project purpose (as defined by the Corps) and be feasible when considering cost, logistics and existing technology.

Criteria for evaluating alternatives as evaluated and determined by the Corps:

Alternatives have been evaluated for their ability to meet the overall project purpose, practicability, and reasonableness. For ease of reference, the overall project purpose is restated here: to construct a storage and transfer facility for use by major air cargo carriers and capable of supporting Alaska's supply chain of food and other goods.

The Federal Aviation Administration (FAA) manages airport lands and is completing an environmental assessment (EA) for the proposed project. Alternatives information for the proposed project as described in their draft EA was provided by agents for the proposed project on behalf of the FAA. This alternatives information is summarized below.

Additional screening criteria include: (1) the allowance for efficient movement between aircraft and the cargo facility; (2) the site being within the Foreign Trade Zone in order to take advantage of air cargo transfer rights granted by the U.S. Department of Transportation, and (3) the site being near aircraft hardstands which are located near existing taxiways. Only sites within the TSAIA were considered, due to these additional screening criteria. No sites removed from the airport were considered.

5.2 Description of alternatives

5.2.1 No action alternative

The "no action alternative" is defined either as a permit denial or an alternative that does not require a Corps permit (33 CFR 325, Appendix B, part (7)(a)). Under this alternative, there would be no development of the property. The upland area present is not sufficient in size for the proposed project and would not meet the overall project purpose. Denial of the proposed project would also not allow for the overall project purpose to be met.

5.2.2 Off-site alternatives

Off-site alternative 1: South Airpark – Siting the proposed project in the South Airpark area was dismissed as the land within is already developed or leased, and additionally does not have taxiway infrastructure to support movement of aircrafts, and therefore doesn't meet additional screening criteria number 3.

Off-site alternative 2: West Airpark – The West Airpark area is largely undeveloped but is planned to be developed by TSAIA with an additional north/south runway, additional taxiways, and roads. Even with the planned development of West Airpark, there would still be sufficient area to site cargo facilities. However, the site is not near existing hardstands, which would limit the practicality of air cargo transfer, and the road perimeter would need to be relocated. This alternative does not meet additional screening criteria number 3.

Off-site alternative 3: North Airpark – The proposed project is sited within North Airpark, but additional undeveloped/unleased lands were considered for the project. A location adjacent to Point Woronzoff Drive was considered, however, due to its size and shape, it would have operational challenges for maneuvering aircraft onsite. Another area east of Postmark Drive was considered but consists of wetlands considered to be of higher quality than those proposed to be impacted. Additionally, this location would require tremendous infrastructure changes to connect the location to the existing taxiways and runways. Other locations in North Airpark also did not meet additional screening criteria numbers 1 and 3.

5.2.3 On-site alternatives

On-site alternative 1 (applicant's preferred alternative): On-site alternative one (1) is the applicant's preferred alternative and is described in section 1.3 of this document. This alternative meets the overall project purpose and screening criteria.

5.3 Alternatives evaluation under the Section 404(b)(1) Guidelines and NEPA

Only On-site Alternative 1 offers a practicable alternative under the Section 404(b)(1) Guidelines, as it would meet the overall project purpose, and is available to the applicants and would be capable of being done after taking into consideration cost, existing technology, and logistics. Additionally, this alternative would be the only alternative reasonable under NEPA as it would meet the purpose and need and goals of the applicant and are technically and economically feasible (40 CFR 1508.1(2)). Other alternatives are not practicable or reasonable either due to unavailability and/or logistical issues.

5.4 Least environmentally damaging practicable alternative under the Section 404(b)(1) Guidelines

The proposed project, the applicant's preferred alternative, is the least environmentally damaging practicable alternative (LEDPA) under the Section 404(b)(1) Guidelines as it is practicable and would result in the least amount of impacts to waters of the U.S., including wetlands while meeting the overall project purpose and screening criteria.

## 6.0 Evaluation for Compliance with the Section 404(b)(1) Guidelines

The following sequence of evaluation is consistent with 40 CFR 230.5

6.1 Practicable alternatives

Practicable alternatives to the proposed discharge consistent with 40 CFR 230.5(c) are evaluated in Section 5.

The statements below summarize the analysis of alternatives:

In summary, based on the analysis in Section 5 above, the no-action alternative, which would not involve discharge into waters of the United States, is not practicable.

For those projects that would discharge into a special aquatic site and are not water dependent, the applicant has demonstrated there are no practicable alternatives that do not involve special aquatic sites.

It has been determined that there are no alternatives to the proposed discharge that would be less environmentally damaging (Subpart B, 40 CFR 230.10(a)).

The proposed discharge in this evaluation is the practicable alternative with the least adverse impact on the aquatic ecosystem, and it does not have other significant environmental consequences.

6.2 Candidate disposal site delineation (Subpart B, 40 CFR 230.11(f))

Each disposal site shall be specified through the application of these Section 404(b)(1) Guidelines:

The disposal site is the proposed project area and includes the wetland area west of North Tug Road at the TSAIA. There are no naturally occurring areas of open water which would be filled as a result of the proposed project, but there are open water ditches which provide for a slow-moving flow of water into stormwater pipes which drain directly into Knik Arm. The discharge of fill into these open water areas would be highly controlled, as the project area site is contaminated with PFAS and PFOS. No water would be allowed to travel offsite as a result of the discharge of fill material until it has been properly treated in accordance with a CMMP approved by ADEC.

6.3 Potential impacts on physical and chemical characteristics of the aquatic ecosystem (Subpart C 40 CFR 230.20-40 CFR 230.25)

The following has been considered in evaluating the potential impacts on physical and chemical characteristics (see Table 2):

**Table 2 – Potential Impacts on Physical and Chemical Characteristics**

| Physical and Chemical Characteristics | N/A | No Effect | Negligible Effect | Minor Effect (Short Term) | Minor Effect (Long Term) | Major Effect |
|---|---|---|---|---|---|---|
| Substrate | | | | | X | |
| Suspended particulates/ turbidity | | X | | | | |
| Water | | | | | | X |
| Current patterns and water circulation | X | | | | | |
| Normal water fluctuations | X | | | | | |
| Salinity gradients | X | | | | | |

Discussion: <u>Substrate</u>: The existing substrates would be compacted under the discharged fill. The discharge of new substrates would be permanent. Impacts to the substrates would include loss or depletion of any functions they provide, such as their ability to hold water or the impede water movement.
<u>Suspended particulates/turbidity</u>: As the site is contaminated, a thorough draft CMMP has been developed and a final draft would be approved by ADEC before implementation. The CMMP’s purpose is to ensure a plan to treat contaminated water before it is allowed to move offsite. Because of this, it is anticipated that discharge activities would be slow and carefully monitored as treatment of the water occurs. It would be expected that due to this slow, methodical treatment there would be little to no increase in suspended particulates and turbidity in open waters on site or within Knik Arm, where water from the site directly discharges.
<u>Water</u>: The proposed project will result in a beneficial impact to water quality. In order to develop the subject wetland area, water on site must be treated for contaminants

before it is allowed to move offsite and discharge into Knik Arm. It is anticipated that due to this treatment water quality would be improved.

6.4 Potential impacts on the living communities or human uses (Subparts D, E and F)

6.4.1 Potential impacts on the biological characteristics of the aquatic ecosystem (Subpart D 40 CFR 230.30)

The following has been considered in evaluating the potential impacts on biological characteristics (see Table 3):

**Table 3 – Potential Impacts on Biological Characteristics**

| Biological Characteristics | N/A | No Effect | Negligible Effect | Minor Effect (Short Term) | Minor Effect (Long Term) | Major Effect |
|---|---|---|---|---|---|---|
| Threatened and endangered species | | X | | | | |
| Fish, crustaceans, mollusks, and other aquatic organisms | | | | | X | |
| Other wildlife | | | | | X | |

Discussion:
Fish crustaceans, mollusks, and other aquatic organisms and Other wildlife: The proposed project would remove 21.6 acres of wetlands. Generally, wetlands provide many functions for aquatic species and other wildlife, such as habitat and water filtration. However, the subject wetlands are actively managed as a public safety measure to prevent certain types of wildlife, such as birds, from utilizing the wetlands. Additionally, these wetlands are contaminated with PFAS, PFOS, and other chemicals (see section 1.4), which are toxins that are difficult to remove from the environment and living organisms. Although there would be a large, permanent loss of wetlands, the wetlands are contaminated and do not function at a high capacity for aquatic organisms and other wildlife. In order to develop the subject wetland, the applicant will be required by ADEC to treat the water and remove/capture contaminants before the water can be discharged into the storm water system. It is anticipated that the treatment of water before it can be discharged into Knik Arm would have a beneficial, long term impact on aquatic organisms and other wildlife.

Threatened and endangered species: See section 10.1.

6.4.2 Potential impacts on special aquatic sites (Subpart E 40 CFR 230.40)

The following has been considered in evaluating the potential impacts on special aquatic sites (see Table 4):

| Table 4 – Potential Impacts on Special Aquatic Sites | | | | | | |
|---|---|---|---|---|---|---|
| **Special Aquatic Sites** | **N/A** | **No Effect** | **Negligible Effect** | **Minor Effect (Short Term)** | **Minor Effect (Long Term)** | **Major Effect** |
| Sanctuaries and refuges | X | | | | | |
| Wetlands | | | | | X | |
| Mud flats | X | | | | | |
| Vegetated shallows | X | | | | | |
| Coral reefs | X | | | | | |
| Riffle pool complexes | X | | | | | |

Discussion: The proposed project would not take place within any sanctuary, refuge, mud flat, vegetated shallows, coral reef, or riffle and pool complex.

Wetlands: The proposed project would result in the permanent loss of 21.6 acres of wetlands. The permanent loss of wetlands would result in a permanent reduction in the functions the wetlands perform. However, due to the advanced degradation of the wetlands and the active management of the wetlands, the subject wetland does not provide many functions. The subject wetland likely functions highest in its ability to store storm water runoff from the surrounding upland development, and it may provide transient habitat to larger mammals, such as moose. However, due to the contamination present, water which runs off into the wetland, becomes contaminated if it was not already contaminated. Additionally transient wildlife which may be utilizing the wetland for food or water are ingesting PFAS, etc. The development of these wetlands would result in improved water quality and would remove an attractant of wildlife to a highly toxic area. The wetland likely also functions to perform carbon sequestration, which may be a function that is not highly impacted by contamination as it is the vegetation, litter, and peat which act to sequester carbon. However, the level of carbon sequestration by the subject wetland is unknown and has not been estimated.

6.4.3 Potential impacts on human use characteristics (Subpart F 40 CFR 230.50)

The following has been considered in evaluating the potential impacts on human use characteristics (see Table 5):

| Table 5 – Potential Effects on Human Use Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Human Use Characteristics** | **N/A** | **No Effect** | **Negligible Effect** | **Minor Effect (Short Term)** | **Minor Effect (Long Term)** | **Major Effect** |
| Municipal and private water supplies | X | | | | | |
| Recreational and commercial fisheries | X | | | | | |

| Table 5 – Potential Effects on Human Use Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| **Human Use Characteristics** | **N/A** | **No Effect** | **Negligible Effect** | **Minor Effect (Short Term)** | **Minor Effect (Long Term)** | **Major Effect** |
| Water-related recreation | X | | | | | |
| Aesthetics | | X | | | | |
| Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves | X | | | | | |

Discussion: The proposed project is not within the vicinity of any known municipal or private water supplies, recreational and/or commercial fisheries, areas of water-related recreation, or park, national and historical monuments, national seashore, wilderness areas, research sites, and any other similar preserve.

Aesthetics: The proposed project would be anticipated to have a negligible impact to aesthetics. It is located on TSAIA property and would be similar in appearance to the surrounding facilities at TSAIA. It would not be anticipated to add to the soundscape of the area at any perceptible level.

6.5 Pre-testing evaluation (Subpart G, 40 CFR 230.60)

The following has been considered in evaluating the biological availability of possible contaminants in dredged or fill material (see Table 6):

| Table 6 – Possible Contaminants in Dredged/Fill Material | |
|---|---|
| Physical substrate characteristics | |
| Hydrography in relation to known or anticipated sources of contaminants | |
| Results from previous testing of the material or similar material in the vicinity of the project | X |
| Known, significant sources of persistent pesticides from land runoff or percolation | X |
| Spill records for petroleum products or designated hazardous substances (Section 311 of the Clean Water Act) | |
| Other public records or significant introduction of contaminants from industries, municipalities, or other sources | |
| Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities | |

Discussion: The subject wetland is known to be contaminated with PFAS, etc., and has been tested to determine contamination levels. The applicant is working with ADEC to address the contamination and would implement a CMMP to treat water on site for contamination. If permitted, the applicant would only be authorized to discharge clean fill and would be prohibited from increasing any contamination levels of the site, or from allowing contamination from the site to move offsite.

It has been determined that additional testing is not required because of the availability of constraints to reduce contamination to acceptable levels within the disposal site and to prevent contaminants from being transported beyond the boundaries of the disposal site.

6.6 Evaluation and testing (Subpart G, 40 CFR 230.61)

Discussion: Due to the known contamination, the applicant has already tested the wetlands and has developed a draft CMMP to treat the contamination during project construction. This testing and the draft CMMP have been coordinated with ADEC, and a final CMMP would need to be approved by ADEC before project construction could begin.

6.7 Actions to minimize adverse impacts (Subpart H)

The following actions, as appropriate, have been taken through application of 40 CFR 230.70-230.77 to ensure no more than minimal adverse effects of the proposed discharge (see Table 7):

| **Table 7 – Actions to Minimize Adverse Effects** | |
|---|---|
| Actions concerning the location of the discharge (40 CFR 230.70) | X |
| Actions concerning the material to be discharged (40 CFR 230.71) | X |
| Actions controlling the material after discharge (40 CFR 230.72) | X |
| Actions affecting the method of dispersion (40 CFR 230.73) | X |
| Actions related to technology (40 CFR 230.74) | X |
| Actions affecting plant and animal populations (40 CFR 230.75) | |
| Actions affecting human use (40 CFR 230.76) | |
| Other actions (40 CFR 230.77) | |

Discussion: During construction of the proposed project, an approved CMMP would be implemented. This CMMP would prescribe how construction would occur in order to minimize adverse impacts. The draft CMMP states that placement of fill material would occur from one direction to encourage contaminated groundwater brought to the surface to seep out in a uniform and predictable manner (40 CFR 230.70 and 230.73). Fill material for the proposed project would be amended with a site-specific blend of activated carbon (40 CFR 230.71 and 230.74). Typical BMPs would be implemented during construction to minimize adverse impacts which may result from the discharge of fill material, such as erosion (40 CFR 230.72).

6.8 Factual Determinations (Subpart B, 40 CFR 230.11)

The following determinations are made based on the applicable information above, including actions to minimize effects and consideration for contaminants (see Table 8):

| **Table 8 – Factual Determinations of Potential Effects** | | | | | | |
|---|---|---|---|---|---|---|
| **Site** | **N/A** | **No Effect** | **Negligible Effect** | **Minor Effect (Short Term)** | **Minor Effect (Long Term)** | **Major Effect** |
| Physical substrate | | | | | X | |
| Water circulation, fluctuation and salinity | X | | | | | |
| Suspended particulates/turbidity | | X | | | | |
| Contaminants | | | | | X | |
| Aquatic ecosystem and organisms | | | | | X | |
| Proposed disposal site | | | | | X | |
| Cumulative effects on the aquatic ecosystem | | | | | X | |
| Secondary effects on the aquatic ecosystem | | | | | X | |

Discussion: See section 6.3 for discussions regarding impacts to physical substrates, water circulation, fluctuation and salinity, suspended particulates/turbidity.  See section 6.5 for a discussion on potential contaminants impacts.  See section 6.4.1 for a discussion of impacts to aquatic ecosystem and organisms.  See section 6.2 for a discussion about the impacts to the proposed disposal site.  See section 9 for a discussion of cumulative impacts.

<u>Secondary effects on the aquatic ecosystem</u>: Secondary effects on the aquatic ecosystem would be expected to be minor due to the careful nature in which the proposed project would be constructed in order to prevent further spread of contamination.  Any secondary effects resulting from construction activities would likely be temporary, lasting only as long as construction.  As the development would introduce vehicles and aircraft into an area they previously did not transit, there could be secondary impacts associated with leaking fluids from such vehicles and aircraft.  This would be anticipated to be minor, however, as it is anticipated that vehicles and aircraft are inspected regularly for leaks, etc.

6.9 Findings of compliance or non-compliance with the restrictions on discharges (40 CFR 230.10(a-d) and 230.12)

Based on the information above, including the factual determinations, the proposed discharge has been evaluated to determine whether any of the restrictions on discharge would occur (see Table 9):

| Table 9 – Compliance with Restrictions on Discharge | | |
|---|---|---|
| **Subject** | **Yes** | **No** |
| 1. Is there a practicable alternative to the proposed discharge that would be less damaging to the environment (any alternative with less aquatic resource effects, or an alternative with more aquatic resource effects that avoids other significant adverse environmental consequences?) | | X |
| 2. Will the discharge cause or contribute to violations of any applicable water quality standards? | | X |
| 3. Will the discharge violate any toxic effluent standards (under Section 307 of the Clean Water Act)? | | X |
| 4. Will the discharge jeopardize the continued existence of endangered or threatened species or their critical habitat? | | X |
| 5. Will the discharge violate standards set by the Department of Commerce to protect marine sanctuaries? | | X |
| 6. Will the discharge cause or contribute to significant degradation of waters of the United States? | | X |
| 7. Have all appropriate and practicable steps (Subpart H, 40 CFR 230.70) been taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem? | X | |

Discussion: See sections 6.1, 10.1, and 10.5 for discussions pertinent to these questions.

## 7.0 General Public Interest Review (33 CFR 320.4 and Regulatory Guidance Letter 84-09)

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest as stated at 33 CFR 320.4(a). To the extent appropriate, the public interest review below also includes consideration of additional policies as described in 33 CFR 320.4(b) through (r). The benefits which reasonably may be expected to accrue from the proposal are balanced against its reasonably foreseeable detriments.

7.1 Public interest factors review

All public interest factors have been reviewed and those that are relevant to the proposal are considered and discussed in additional detail (see Table 10):

| Table 10 – Public Interest Factors | | | | | | |
|---|---|---|---|---|---|---|
| Factor | None | Detrimental | Neutral (mitigated) | Negligible | Beneficial | Not Applicable |
| 1. Conservation: The proposed project would result in the loss of 21.6 acres of wetlands. However, the subject wetland is highly degraded, contaminated, and because it is a part of TSAIA, does not provide high value of habitat to wildlife, such as migratory birds. Water displaced by the proposed project's construction would be treated before it would be allowed to move offsite. Additionally, compensatory mitigation would be required for the wetland loss. | | | X | | | |
| 2. Economics: The proposed project would be anticipated to have a beneficial impact to at least the local economy. The project would likely hire local contractors to perform the work, and after completion the project would allow the applicant to handle the growing demand for air cargo storage needs. | | | | | X | |
| 3. Aesthetics: The proposed project location is at TSAIA and would be similar to the surrounding development. It would be anticipated that only negligible impacts to aesthetics would occur. | | | | X | | |
| 4. General Environmental Concerns: Although the proposed project would result in the loss of 21.6 acres of wetland area, the loss would be minimal as the subject wetland is not high functioning. The wetland is severely degraded by surrounding development and contamination and does not provide quality habitat for wildlife. The loss would require compensatory mitigation, and the applicant would be required to treat water displaced from the wetland before it is allowed to travel offsite, which would be anticipated to bring a beneficial impact to water quality in the immediate area, including at the water's discharge point into Cook Inlet. | | | X | | | |
| 5. Wetlands: See section 6.4.2 for a discussion of impacts to wetlands, and section 8.2 for a discussion of compensatory mitigation requirements for the unavoidable impacts to waters of the U.S., including wetlands. | | | X | | | |
| 6. Historic Properties: See section 10.3 for a discussion of impacts to historic properties. | X | | | | | |

| Table 10 – Public Interest Factors | | | | | | |
|---|---|---|---|---|---|---|
| Factor | None | Detrimental | Neutral (mitigated) | Negligible | Beneficial | Not Applicable |
| 7. Fish and Wildlife Values: The proposed project would impact contaminated wetlands located at TSAIA. The TSAIA does not allow migratory birds to utilize wetlands on TSAIA property, as a safety precaution. This subject wetland may provide minimal habitat value to transient wildlife, such as moose. However, the value is assumed to be low due to the contamination of the site. Any wildlife utilizing this wetland area is exposed to extremely harmful toxins. The development of this wetland area would prevent wildlife from being exposed to these toxins, and the water displaced by construction would be required to be treated before it is allowed to move offsite. Currently untreated water containing hazardous chemicals moves slowly offsite and directly into Cook Inlet. It is unknown how successful treatment of the water would be (i.e., whether all contaminants are able to be removed/captured), but it would be anticipated that much of the contaminants would be removed/captured and an increase to the quality of water being discharged directly into Cook Inlet would be realized. This, in turn, would be beneficial to fish and wildlife within Cook Inlet. | | | X | | | |
| 8. Flood Hazards: The proposed project would convert 21.6 acres of wetland into uplands. A decrease in wetland area increases the risk for localized flooding. However, the proposed project would be required to maintain hydrology, and would not allow for localized flooding. Additionally, there is a storm water system inlet nearby where water would flow to and then directly into Cook Inlet. | X | | | | | |
| 9. Floodplain Values: The proposed project is not located within a floodplain. | | | | | | X |
| 10. Land Use: The proposed project is located on TSAIA property, and is in line with TSAIA's land use plan. | | | | | X | |
| 11. Navigation: The proposed project is not located within a navigable water. | | | | | | X |
| 12. Shoreline Erosion and Accretion:The proposed project is not located along any shoreline. | | | | | | X |

| Table 10 – Public Interest Factors | | | | | | |
|---|---|---|---|---|---|---|
| Factor | None | Detrimental | Neutral (mitigated) | Negligible | Beneficial | Not Applicable |
| 13. Recreation: The proposed project would be anticipated to have no impact to recreation as the subject wetland area does not facilitate any recreation currently. | X | | | | | |
| 14. Water Supply and Conservation: The proposed project would not impact water supply or water conservation. The constructed facilities would be expected to be connected to municipal water supply. | X | | | | | |
| 15. Water Quality: See sections 6.3 and 10.5 for discussions regarding water quality. The proposed project would be anticipated to result in a net benefit to water quality being directly discharged into Cook Inlet. | | | | | X | |
| 16. Energy Needs: The proposed project is not one which would have an impact on energy needs. | X | | | | | |
| 17. Safety: The proposed project would not be anticipated to have any impact to safety. | X | | | | | |
| 18. Food and Fiber Production: The proposed project is not one involving food and/or fiber production. | | | | | | X |
| 19. Mineral Needs: The proposed project is not one that involves mineral needs. | | | | | | X |
| 20. Consideration of Property Ownership: The subject land is owned by TSAIA and would be leased to Alaska Cargo and Cold Storage. | | | | | X | |
| 21. Needs and Welfare of the People: The proposed project would help to clean up a contaminated site, and serve to increase air cargo storage capacity for residents and businesses of Alaska. However, it would result in the loss of wetlands, which nearby residents have expressed concerns with. | | | X | | | |

## 7.2 Public and private need

The relative extent of the public and private need for the proposed structure or work:

There is mostly a private need for the proposed project, as it would allow Alaska Cargo and Cold Storage to expand their operational capacity. It would also serve the public in allowing for greater capacity and efficiencies in shipments of goods.

7.3 Resource use unresolved conflicts

If there are unresolved conflicts as to resource use, explain how the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work was considered.

There were no unresolved conflicts identified as to resource use.

7.4 Beneficial and/or detrimental effects on the public and private use

The extent and permanence of the beneficial and/or detrimental effects that the proposed work is likely to have on the public and private use to which the area is suited is described below:

Detrimental effects are expected to be minimal and permanent.

Beneficial effects are expected to be minimal and permanent.

The proposed project would convert 21.6 acres of wetlands permanently to uplands, the detrimental impacts from doing so would likely be permanent. Additionally, due to the permanence of the proposed project, the beneficial effects (i.e., the treatment of contaminated water flowing from the site) would also be expected to be permanent.

7.5 Climate Change

The proposed activities within the Corps' federal control and responsibility likely will result in a negligible release of greenhouse gases into the atmosphere when compared to global greenhouse gas emissions. Greenhouse gas emissions have been shown to contribute to climate change. Aquatic resources can be sources and/or sinks of greenhouse gases. For instance, some aquatic resources sequester carbon dioxide whereas others release methane; therefore, authorized impacts to aquatic resources can result in either an increase or decrease in atmospheric greenhouse gas. These impacts are considered de minimis. Greenhouse gas emissions associated with the Corps' federal action may also occur from the combustion of fossil fuels associated with the operation of construction equipment, increases in traffic, etc. The Corps has no authority to regulate emissions that result from the combustion of fossil fuels. These are subject to federal regulations under the Clean Air Act and/or the Corporate Average Fuel Economy (CAFE) Program. Greenhouse gas emissions from the Corps' action have been weighed against national goals of energy independence, national security, and economic development and determined not contrary to the public interest.

## 8.0 Mitigation

(33 CFR 320.4(r), 33 CFR Part 332, 40 CFR 230.70-77, and 40 CFR 1508)

8.1 Avoidance and minimization

Avoidance and Minimization: When evaluating a proposal including regulated activities in waters of the United States, consideration must be given to avoiding and minimizing effects to those waters. Avoidance and minimization are described in Section 1.3.1 above.

Describe other mitigative actions including project modifications implemented to minimize adverse project impacts? (See 33 CFR 320.4(r)(1)(i))

No other mitigative actions would be implemented than as described in section 1.3.1 of this document.

8.2 Compensatory mitigation requirement

Is compensatory mitigation required to offset environmental losses resulting from proposed unavoidable impacts to waters of the United States? Yes.

Provide rationale: The proposed project would permanently convert 21.6 acres of wetlands to uplands. Although these wetlands are highly degraded and contaminated, and therefore do not provide high value functions, they do still function in a degraded capacity. The subject wetlands store water, provide minimal wildlife habitat, and sequester carbon.

8.3 Type and location of compensatory mitigation

8.3.1 Mitigation bank service area

Is the impact in the service area of an approved mitigation bank? Yes.

Does the mitigation bank have the appropriate number and resource type of credits available? Yes, the following is a list of approved mitigation banks and their number of appropriate and available credits.

Harmany Ranch Wetland Mitigation Bank: 3.32 flat wetland credits and 12.76 riverine wetland credits
Diamond Willow Mitigation Bank: 72 palustrine credits
Portage Reserve Mitigation Bank: 96.86 palustrine mixed credits

8.3.2 In-lieu fee program service area

Is the impact in the service area of an approved in-lieu fee program? Yes.

Does the in-lieu fee program have the appropriate number and resource type of credits available? Yes, the following is a list of in-lieu fee programs and their number of appropriate and available credits.

Great Land Trust, Mink Creek Site: 39.26 palustrine credits

Great Land Trust, REV Municipality of Anchorage: 438.93 credits

8.3.3 Compensatory mitigation

Selected compensatory mitigation type/location(s) (see Table 11):

| Table 11 – Mitigation Type and Location | |
|---|---|
| Mitigation bank credits | X |
| In-lieu fee program credits | |
| Permittee-responsible mitigation under a watershed approach | |
| Permittee-responsible mitigation, on-site and in-kind | |
| Permittee-responsible mitigation, off-site and/or out-of-kind | |

8.3.4 Mitigation hierarchy

Does the selected compensatory mitigation option deviate from the order of the options presented in 33 CFR 332.3(b)(2)-(6)? No, the applicant has proposed to purchase credits from Harmany Ranch Wetland Mitigation Bank.

8.3.5 Watershed approach

Does the selected compensatory mitigation option follow a watershed approach? N/A

8.4 Amount of compensatory mitigation

The amount of required compensatory mitigation was determined using the Anchorage Credit/Debit Methodology (ADCM). Calculations were completed by an agent on behalf of the applicant. The Corps reviewed and approved the calculations for accuracy. Applying the ADCM, the loss of 21.6 acres of wetlands results in 13.73 debits. Subtracting the 9.28 Klatt Bog credits allotted by TSAIA for the proposed project, leaves 4.45 debits. Klatt Bog wetland mitigation credits were calculated using the first version of the ADCM. The ADCM methodology has since been modified, therefore no multiplier was applied to the proposed project's debits before subtracting the Klatt Bog wetland mitigation credits. Since the ADCM's methodology was modified, it has been found that the ADCM alone does not result in debits which result in adequate preservation-only compensatory mitigation (i.e., it results in preservation-only ratios that are less than 1:1), and in order to comply with 33 CFR 332.3(f)(2) and (h)(2), a multiplier of 3.3 is applied to the remaining debits. This results in a total of 14.685 credits required to offset the remaining 4.45 debits.

## 9.0 Consideration of Cumulative Effects

(40 CFR 1508 & RGL 84-9) Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor direct and indirect but collectively significant actions taking place over a period of time. A cumulative effects assessment should consider how the direct and

indirect environmental effects caused by the proposed activity requiring DA authorization (i.e., the incremental impact of the action) contribute to the aggregate effects of past, present, and reasonably foreseeable future actions, and whether that incremental contribution is significant or not.

9.1 Identify/describe the direct and indirect effects which are caused by the proposed activity:

The proposed project would result in the direct loss of 21.6 acres of wetlands. The functions and values of this wetland area as discussed in sections 6.0 and 7.0, would be permanently lost.

9.2 The geographic scope for the cumulative effects assessment is:

The geographic scope for the cumulative effects assessment is within the City of Anchorage, specifically the area immediately surrounding the proposed project, to include the TSAIA and the Turnagain Arm residential neighborhoods, commercial, and institutional developments to the west of TSAIA which are encompassed by a portion the Knik Arm-Frontal Cook Inlet Watershed (HUC 190204010808). The geographic scope was not chosen to be the entire Knik Arm-Frontal Cook Inlet Watershed, as that watershed is over 200,000 acres in size and includes all of Cook Inlet and lands across Cook Inlet. Assessing cumulative impacts at such a large scope would serve to dilute the proposed project's cumulative impacts

9.3 The temporal scope of this assessment covers:

The temporal scope of this assessment covers the history of the watershed for which data is available through the life of the proposed fill and structures. The proposed project is intended to be permanent.

9.4 Describe the affected environment:

The affected environment includes the City of Anchorage at the TSAIA and the residential neighborhoods, as well as the commercial and institutional areas to the west of the TSAIA which are encompassed by a portion of the Knik Arm-Frontal Cook Inlet Watershed. These areas all drain to the same area of Cook Inlet. Being a part of the largest city in the state, this area has seen heavy urban development, and continues to see such urban development. Between 1950 and 1990, the Anchorage area lost approximately 52% (9,958 acres of 18,903 acres) of its wetlands to development (Anchorage Wetland Trends Study; USFWS, 1993). Comments included in the 2014 Anchorage Wetlands Management Plan claim that there were around 4,000 acres of wetlands remaining in the Municipality of Anchorage (MOA, 2014). Assuming this was an accurate estimate, the MOA would have lost an additional 4,945 acres between 1990 and 2014 (78.8% of the 1950 estimated acreage of wetlands).

In addition to the proposed project, there is currently a permit application (POA-2021-00209) for the proposed filling of 14.42 acres of the same subject wetland, immediately adjacent to this proposed project. Cumulatively, if both projects receive a favorable permit decision, 36.02 acres of the subject wetland would be completely filled. That acreage constitutes a majority of the subject wetland.

9.5 Determine the environmental consequences:

The proposed project would add cumulatively to the area of developed land and impervious surface within the city of Anchorage. Increases in impervious surface would directly increase urban runoff pollutant contribution, and without the wetland's ability to store runoff, such runoff could potentially reach Cook Inlet faster.

The proposed project would not be expected to trigger additional development within the area, as the directly surrounding area has almost been maximally developed, as shown by aerial imagery.

9.6 Conclusions regarding cumulative impacts:

When considering the direct and indirect impacts that will result from the proposed activity, in relation to the overall direct and indirect impacts from past, present, and reasonably foreseeable future activities, the incremental contribution of the proposed activity to cumulative impacts in the area described in section 9.2, are not significant. Compensatory mitigation will be required to offset the impacts of the proposed activity to eliminate or minimize its incremental contribution to cumulative effects within the geographic area described in Section 9.2. Mitigation required for the proposed activity is discussed in Section 8.0.

## 10.0 Compliance with Other Laws, Policies and Requirements

10.1 Section 7(a)(2) of the Endangered Species Act (ESA)

Refer to Section 2.2 for description of the Corps' action area for Section 7 of the ESA.

10.1.1 Lead federal agency for Section 7 of the ESA

Has another federal agency been identified as the lead agency for complying with Section 7 of the ESA with the Corps designated as a cooperating agency and has that consultation been completed? No.

10.1.2 Listed/proposed species and/or designated/proposed critical habitat

Are there listed or proposed species and/or designated critical habitat or proposed critical habitat that may be present or in the vicinity of the Corps' action area? No. The Corps has determined that it has fulfilled its responsibilities under Section 7(a)(2) of the ESA

Effect determination(s), including no effect, for all known species/habitat, and basis for determination(s): As there are no ESA listed species or designated critical habitat within the action area of the proposed project, the proposed project would have no effect on any such species or habitat. The NMFS did comment on the proposed project (see section 4.1) stating that a rigorous clean-up and water quality testing plan must be implemented. Such a plan is being developed with the ADEC and would be required to be implemented by the ADEC. It is anticipated that although the action area does not extend to Cook Inlet, the treatment of water displaced by proposed project construction would increase the water quality of water being discharged into Cook Inlet.

10.2 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Essential Fish Habitat (EFH)

10.2.1 Lead federal agency for EFH provisions of the Magnuson-Stevens Act

Has another federal agency been identified as the lead agency for complying with the EFH provisions of the Magnuson-Stevens Act with the Corps designated as a cooperating agency and has that consultation been completed? No.

10.2.2 Magnuson-Stevens Act

Did the proposed project require review under the Magnuson-Stevens Act? Yes.

10.2.3 EFH species or complexes

Were EFH species or complexes considered? No, the proposed project would not take place within any EFH.

Effect determination and basis for that determination: As the proposed project would not take place within any EFH, there would be no adverse effect to EFH or any EFH species. It is anticipated that although the proposed project would not take place within Cook Inlet, the treatment of water displaced by the proposed project construction would increase the water quality of water being discharged into Cook Inlet.

10.3 Section 106 of the NHPA

Refer to Section 2.3 for permit area determination.

10.3.1 Lead federal agency for Section 106 of the NHPA

Has another federal agency been identified as the lead federal agency for complying with Section 106 of the NHPA with the Corps designated as a cooperating agency and has that consultation been completed? No.

10.3.2 Historic properties

Known historic properties present? No, there are no known historic properties present within or within the vicinity of the permit area.

Effect determination and basis for that determination: As there are no known historic properties within or within the vicinity of the permit area, the Corps determined there would be No Historic Properties Affect as a result of the proposed project’s completion.

This determination was published in the Corps' July 11, 2022, public notice. Concurrence was received from the SHPO on July 29, 2022.

10.3.3 Consultation with the appropriate agencies, tribes and/or other parties for effect determinations

Consultation was initiated and completed with the appropriate agencies, tribes and/or other parties for any determinations other than "no potential to cause effects."

10.4 Tribal Trust Responsibilities

10.4.1 Tribal government-to-government consultation

Was government-to-government consultation conducted with federally-recognized tribe(s)? No, no requests for government-to-government consultation were received.

10.4.2 Other Tribal consultation

Other Tribal consultation including any discussion of Tribal Treaty rights.

N/A

10.5 Section 401 of the Clean Water Act – Water Quality Certification (WQC)

10.5.1 Section 401 WQC requirement

Is an individual Section 401 WQC required, and if so, has the certification been issued or waived?

A 401 WQC has not yet been issued, denied, or waived from the ADEC as of the date of this decision. If the project is found to have no significant impact (section 12.3), to comply with the Section 404(b)(1) Guidelines (section 12.4), and not to be contrary to the public interest (section 12.5), a provisional permit would be proffered. A final permit would only be issued after a 401 WQC has been issued or waived by ADEC and after the Environmental Protection Agency (EPA) has made a determination that the discharge would not affect water quality in a neighboring jurisdiction.

10.5.2 401(a)(2) Process

If the certifying authority granted an individual WQC, did the United States Environmental Protection Agency make a determination that the discharge 'may affect' water quality in a neighboring jurisdiction? N/A

Provide an explanation of the determination of the effect on neighboring jurisdiction.

See section 10.2.1 above. A 401 WQC has not been issued, denied, or waived by the ADEC as of the date of this decision. If the ADEC issues a WQC it will be coordinated with the EPA to determine potential affects on neighboring jurisdictions.

10.6 Coastal Zone Management Act (CZMA)

10.6.1 Coastal Zone Management Consistency under Section 307c of the CZMA: By operation of Alaska State law, the federally approved Alaska Coastal Management Program expired on July 1, 2011, resulting in a withdrawal from participation in the Coastal Zone Management Act's (CZMA) National Coastal Management Program. The CZMA Federal consistency provision, section 307, no longer applies in Alaska. Federal Register Notice published July 7, 2011, Volume 76 N. 130, page 39857.

10.7 Wild and Scenic Rivers Act

10.7.1 National Wild and Scenic River System

Is the project located in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system? No.

10.8 Effects on Corps Civil Works Projects (33 USC 408)

10.8.1 Permission requirements under Section 14 of the Rivers and Harbors Act (33 USC 408)

Does the applicant also require permission under Section 14 of the Rivers and Harbors Act (33 USC 408) because the activity, in whole or in part, would alter, occupy, or use a Corps Civil Works project?

No, there are no federal projects in or near the vicinity of the proposal.

10.9 Corps Wetland Policy (33 CFR 320.4(b))

10.9.1 Wetland Impacts

Does the project propose to impact wetlands? Yes.

10.9.2 Wetland impact public interest review

Based on the public interest review herein, the beneficial effects of the project outweigh the detrimental impacts of the project.

10.10 Other (as needed)

N/A

10.11 Compliance Statement

The Corps has determined that it has fulfilled its responsibilities under the following laws, regulations, policies, and guidance:

| Table 13 – Compliance with Federal Laws and Responsibilities | | |
|---|---|---|
| **Laws, Regulations, Policies, and Guidance** | **Yes** | **N/A** |
| Section 7(a)(2) of the ESA | X | |
| EFH provisions of the Magnuson-Stevens Act | X | |
| Section 106 of the NHPA | X | |
| Tribal Trust | X | |
| Section 401 of the Clean Water Act | See section 10.5 | |
| CZMA | | X |
| Wild and Scenic Rivers Act | | X |
| Section 408 - 33 USC 408 | | X |
| Corps Wetland Policy (33 CFR 320.4(b)) | X | |
| Other: N/A | | X |

## 11.0 Special Conditions

11.1 Special condition(s) requirement(s)

Are special conditions required to ensure minimal effects, ensure the authorized activity is not contrary to the public interest and/or ensure compliance of the activity with any of the laws above? Yes.

11.2 Required special condition(s)

Special Condition 1: The permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the authorized work area. The erosion control measures shall remain in place and be maintained until all authorized work is completed and the work areas are stabilized. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion.

*Rationale: This condition is required to ensure that areas outside of the permitted area are protected from sediment caused by erosion, slumping, or lateral displacement of surrounding bottom deposits until the site is permanently stabilized (33 CFR 320.4(b), 40 CFR 230.20(b), 40 CFR 230.21, and 40 CFR 230.72(a)).*

Special Condition 2: The permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, automotive parts, asphalt, construction materials, concrete blocks with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

*Rationale: This condition is required to prevent adverse impacts to wetlands and other waters of the U.S. outside of the permitted project area (33 CFR 320.4(b) and (d), 40 CFR 230.11(c) and (d), and 40 CFR 230.60)).*

Special Condition 3: No stockpiling of fill materials shall occur in wetlands or other waters of the U.S. that do not have DA authorization.

*Rationale: This condition is required to avoid adverse impacts to adjacent wetlands as a result of the permitted project (33 CFR 320.4(b)(1), 33 CFR 320.4(r)(1), and 40 CFR 230.41).*

Special Condition 4: Natural drainage patterns shall be maintained using appropriate ditching, culverts, storm drain systems, and other measures to ensure hydrology is not altered.

*Rationale: This condition is required to minimize impacts to adjacent wetlands and other waters of the U.S. as a result of the permitted project (33 CFR 320.4(b) and (l) and 40 CFR 230.41).*

Special Condition 5: Prior to commencing the work authorized by this permit, the permittee shall utilize 9.28 Klatt Bog Credits to partially offset the project's calculated 13.73 debits. To offset the remaining 4.45 debits, the permittee shall purchase 14.685 credits of the appropriate type from Harmany Ranch Wetland Mitigation Bank, as proposed by the permittee and approved by the Corps. Such credit utilization and purchase will offset the loss of 21.6 acres of palustrine emergent and scrub-shrub wetlands. You must email the signed credit transaction form to mitigationmanager@usace.army.mil and to Roberta Budnik (roberta.k.budnik@usace.army.mil) upon completion of credit transaction (see form attached). If you are unable to complete this transaction, you are required to obtain a permit modification prior to commencing the work authorized by this permit for approval of an alternate mitigation method.

*Rationale: This condition is required to compensate for resource losses important to the human and aquatic environment (33 CFR 320.4(r)(1), 33 CFR 332.1, 33 CFR 332.3(a)(1) and (b)(3), and 40 CFR 230.41).*

Special Condition 6: Within 60 days of completion of the work authorized by this permit, the Permittee shall submit as-built drawings of the authorized work and a completed "As-Built Certification By Professional Engineer" form (attached) to the Corps (U.S. Army Corps of Engineers, Regulatory Division, by email at regpagemaster@usace.army.mil and Ms. Roberta Budnik, Project Manager at roberta.k.budnik@usace.army.mil). The as-built drawings shall be signed and sealed by a registered professional engineer and include the following:

a. A list of any deviations between the work authorized by this permit and the work as constructed. In the event that the completed work deviates, in any manner, from the authorized work, describe on the attached "As-Built Certification By Professional Engineer" form the deviations between the work authorized by this permit and the work as constructed. Clearly indicate on the as-built drawings any deviations that have been listed. Please note that the depiction and/or description of any deviations on the drawings and/or "As-Built Certification By Professional Engineer" form does not constitute approval of any deviations by the Corps.

b. Include the Department of the Army permit number on all sheets submitted.

Rationale: *This special condition is required to ensure compliance with the permit and in order to efficiently plan compliance inspections.*

Special Condition 7: All contractors involved in this permitted activity shall be provided copies of this permit in its entirety. A copy shall remain on site at all times during construction.

*Rationale: This special condition is required to ensure compliance with the permit, and to minimize impacts to adjacent wetlands and other waters of the U.S. as a result of the permitted project (33 CFR 320.4(b) and 40 CFR 230.41).*

## 12.0 Findings and Determinations

12.1 Section 176(c) of the Clean Air Act General Conformity Rule Review:

The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed *de minimis* levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

12.2 Presidential Executive Orders (EO)

12.2.1 EO 11988, Floodplain Management

This action is not located in a floodplain.

12.2.2 EO 12898 and EO 14008, Environmental Justice

12.2.2.1 Provide details regarding screening and mapping tools and available information utilized during the review.

The Corps utilized the EPA's "EJ Screen" (Environmental Justice Screening and Mapping Tool Version 2.1) to complete this review. The EPA's EJScreen utilizes the 2016-2020 American Community Survey data from the U.S. Census. The Corps also used current U.S. Census data and estimates.

The Corps understands that it is preferred to use the Council on Environmental Quality's (CEQ) EJ tool, however, this tool lacks information about Alaska. The EPA's EJ screen contains information sufficient to complete this review.

12.2.2.2 Have disadvantaged communities been identified within the vicinity of the proposed project? No.

Using the EPA's EJScreen, the Corps generated a standard report of the affected environment. It was determined that the most appropriately defined affected environment includes a two-and-a-half-mile radius from the approximate center of the subject wetlands. This radius was determined to be most appropriate because it includes the nearby residential neighborhoods whose residents are most likely to notice changes occurring at the airport or impacts due to the changes at the airport (such as increased traffic of delivery trucks). The two-and-a-half-mile radius captures a population of approximately 19,256 individuals within 19.63 square miles.

"Disadvantaged communities" is a term used interchangeably with "low income" and "minority" populations. To determine if any disadvantaged communities exist within the affected environment, the "Fifty Percent," "Meaningfully Greater," and "Low-Income Threshold Criteria" analyses as described in "Promising Practices for EJ Methodologies in NEPA Reviews" (Federal Interagency Working Group on Environmental Justice & NEPA Committee; March 2016) were conducted for the reported percentages of People of Color (POC; i.e., minority) and Low Income individuals/households within the affected environment. The Municipality of Anchorage (MOA) was used as a reference community to perform the "Meaningfully Greater" analysis and compare Low Income percentages.

| | People of Color (%) | Low Income (%) |
|---|---|---|
| Municipality of Anchorage (Ref. Community) | 39.7* | 9.2 – 22.7** |
| Affected Environment*** | 37 | 19 |

* U.S. Census Bureau Quick Facts, population estimates July 1, 2021
**American Community Survey (U.S. Census Bureau) 5-year estimates
***EJScreen Standard Report

The EPA's EJScreen's "Low Income" index is defined as the percent of a population where the household income is less than or equal to twice the federal "poverty level." The federal poverty level is set by the Department of Health and Human Services, and in Alaska for 2021 ranged from $16,090 for a household of one to $55,850 for a household of eight (https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references/2021-poverty-guidelines). Per the EJScreen's definition, "low income" is considered to be $32,180 for a household of one to $111,700 for a household of eight. According to the American Community Survey's (U.S. Census Bureau) 5-year estimates subject tables for income in the past 12 months in 2021 inflation-adjusted dollars, in the reference community (MOA), 9.2% of "nonfamily" households (a householder living alone or shares a home exclusively with others they are not related to) had an income of between $15,000 to $24,999, and 22.7% of "families" (household maintained by householder who is in a family and also includes unrelated people residing in the same home) had an income between $100,000 to $149,999. It should be noted that the Corps was unable to find data that listed income data specific to the number of people per household. As such, the federal poverty level for a household of eight was used in the determination of the range of percentages of Low Income households.

As there is a population of POC less than 50% in the affected environment, and not meaningfully greater than the reference area, no disadvantaged communities based on minorities exists within the vicinity of the proposed project. Additionally, as the percentage of Low Income individuals is within the range of the reference community, no disadvantage community exists based on income.

12.2.2.3 What meaningful involvement efforts did the Corps take for potentially affected disadvantaged communities and other interested individuals, communities, and organizations?

The Corps published a Public Notice for the proposed project, which directly notified adjacent neighbors, the MOA, congressional representatives, nearby federally recognized Tribes, media outlets, Native corporations, as well as an administratively maintained distribution list of individuals who sought to receive all Corps public notices.

12.2.2.4 Describe if resource impacts are high and adverse.

Resource impacts have been evaluated throughout sections 6.0 and 7.0 of this document and have been determined not to be high and adverse with the inclusion of compensatory mitigation to offset unavoidable impacts.

Do the impacts fall disproportionately on disadvantaged communities? No.

12.2.2.5 Based upon the discussion and analysis in the preceding sections, the Corps has determined that portions of the proposed project within our federal control and responsibility would not have a disproportionately high and adverse human health or environmental effect on disadvantaged communities.

12.2.3 EO 13112, Invasive Species, as amended by EO 13751

There are no invasive species issues involved in this proposed project.

12.2.4 EO 13212 and EO 13302, Energy Supply and Availability

The proposal is not one that will increase the production, transmission, or conservation of energy, or strengthen pipeline safety.

12.3 Findings of No Significant Impact

Having reviewed the information provided by the applicant and all interested parties and an assessment of the environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an environmental impact statement will not be required.

12.4 Compliance with the Section 404(b)(1) Guidelines

The proposed discharge complies with the Guidelines.

12.5 Public interest determination

Having reviewed and considered the information above, I find that the proposed project is not contrary to the public interest. The permit will be issued with appropriate conditions included to ensure minimal effects, ensure the authorized activity is not contrary to the public interest and/or ensure compliance of the activity with any of the authorities identified in Section 10.

**PREPARED BY:**

Roberta K. Budnik

Date: June 28, 2023

Roberta K. Budnik
Project Manager

**REVIEWED BY:**

Emily Vullo

Date: June 29, 2023

Emily Vullo
Project Manager

# APPENDIX F:

# PUBLIC INVOLVEMENT

# TABLE OF CONTENTS

# ANCHORAGE DAILY NEWS
## AFFIDAVIT OF PUBLICATION

Account #: 100515 DOWL
4041 B STREET, ANCHORAGE, AK 99503

Order#:W0030291 Cost: $259.9

STATE OF ALASKA
THIRD JUDICIAL DISTRICT

Adam Ganigus being first duly sworn on oath deposes and says that she is a representative of the Anchorage Daily News, a daily newspaper. That said newspaper has been approved by the Third Judicial Court, Anchorage, Alaska, and it now and has been published in the English language continually as a daily newspaper in Anchorage, Alaska, and it is now and during all said time was printed in an office maintained at the aforesaid place of publication of said newspaper. That the annexed is a copy of an advertisement as it was published in regular issues (and not in supplemental form) of said newspaper on

05/29/2022

and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is not in excess of the rate charged p1ivate individuals.

Signed

Subsc1ibed and sworn to before me
this 31st day of May 2022.

Notary Public in and for
The State of Alaska.
Third Division
Anchorage, Alaska

MY COMMISSION E:>..'PIRES
7/17/2024
JADA L. NOWLING

**NOTICE OF INTENT TO PREPARE**
**AN ENVIRONMENTAL ASSESSMENT**

**Project Title: Alaska Cargo & Cold Storage Facility**

Alaska Cargo and Cold Storage, LLC, in cooperation with the Federal Avlation Administration (FAA) is soliciting comments and information on a proposal to construct cargo infrastructure at Ted Stevens Anchorage International Airport (ANC) in Anchorage, Alaska. The proposed project will be incorporated into the ANC Airport Layout Plan and require approval from the FAA and therefore 1s subject to the National Environmental Policy Act (NEPA). An environmental assessment is being prepared for the project to consider any environmental impacts. The purpose of the proposed project is to develop infrastructure to support air cargo operations at ANC.

The proposed work requiring federal approval would include:
* New Aircraft Parking Apron
* cargo warehouse
* Cold Storage
* Hardstand Fuel Distribution
* Ground support Equipment Shop and Parking
* Ancillary/Control Space
* Road Connection to Postmark Drive

This proposed project will comply with section 106 of the National Historic Preservation Act; Executive Orders: 11990 (Wetlands Protection), 11988 (Floodplain Protection), 12898 (Environmental Justice), 11593 (Historic Preservation), 13084 (Consultation and Coordination with Indian Tribal Governments), the Clean Air Act, Clean Water Act, Fish and Wildlife coordination Act, and U.S. DOT Act Section 4(f).

construction for the proposed project is anticipated to begin in fall 2022. To ensure that all possible factors are considered, please provide written comments to the following address by July 1, 2022.

Joe Jacobson
Alaska Cargo and Cold Storage
jjacobson@mckinley-alaska.com
**(907) 339-1412**

If you have any questions or require additional information, please contact Jason Gamache, Project Manager, at (907) 563-8474 or Theresa Dutchuk, NEPA Specialist, at (907) 865-1238.

Pub: May 29, 2022

Notary Public
State of Alaska
My Commfssfon Expires Jtjl 14,024

**From:** ivoryjune@acsalaska.net
**To:** Theresa Dutchuk
**Cc:** jgamache@exploredesign.com; jjacobson@alaska.com; d.cook@eklutna.org; manning.bryan@epa.gov; dot.aiaancinfo@alaska.gov
**Subject:** [EXT] Ted Stevens International Airport Cold Storage and Cargo Expansion for 2022
**Date:** Friday, July 1, 2022 3:54:07 PM

You don't often get email from ivoryjune@acsalaska.net. Learn why this is important

**WARNING:** *External Sender - use caution when clicking links and opening attachments.*

Hello,

I am writing to voice my concerns regarding the Ted Stevens Intl. Airport (TSIA) Cold storage and Cargo Expansion for
fall 2022.

Foremost this project seems, quite, rushed. It makes no sense to me that a complete thorough unbiased
investigations could be done, already, in such a short time period!

I am concerned about the increase of varied pollutants that will adversely affect humans and the eco-systems too. This
expansion is complex, a-never-done- before, cold storage operation with increased cargo airplane traffic, at the proposed
120 acre,, aforesaid, expansion. This 'expansion' entails details for planning, organizing, unbiased assessments, and sensible adjustments, PLUS
unbiased monitoring! ALL, of this needs to be carefully addressed, allowing for transparency to the public!
The land, humans and animals deserve to be protected and 'given' positive stewardship!

Economic Justice for the public and environs are needed here, to assure safety for the complex
entities, involved, Prevention, preparedness and response to hazardous chemical spills of numerous types, need
careful serious considerations! The belugas of the Cook Inlet are already near extinction.
Fish returns are much lower, and likely more nature is being adversely affected by chemical run-off from the TSIA tarmac, today!
Plus, local waterways are negatively-affected by increased PFAs, and many more chemicals, used while operating
the TSIA, Anch., AK.

A refrigerant spill would be disastrous on a multiplicated-scale, here at TSIA!
Considerations for fires, gases, and the corrosiveness of refrigerant hazards, needs mitigation too.
As an accident will break down metals like iron, copper, zinc and their alloys, that may occur from a refrigerant/spill!

All this, and perhaps more, must be given serous considerations for safety purposes. Death will
occur without complex mitigation plans, unbiased-assessment, and also corrective reactions are vital, to
assuring a safe environment; especially at places that use refrigerants; on the ***large-scale (never-done-before) plans,***
proposed to complete the TSIA Cold Storage and Cargo expansion for 2022!

Cargo restrictions are more lenient due to the Jone's Act. *Why isn't this openly disclosed to the public?* Who will
closely monitor what will be inside those foreign cargo planes? What is TSIA's greatest advantage for this
seemingly, 'loop hole'?

The 'reports' regarding pollutants that dotaia.ancinfo@alaska.gov are mostly dated information.

The FAA is to have final approval of this expansion, yet nationally, that entity, barely, regulates, themselves! I have
little confidence in their position, approving and understanding this unique-to-the-world, cargo expansion!

The Port of Anchorage is already dilapidated, and any new port will, also, will likely fail, as the Cook Inlet silt and tides,
will not forgive any type of manmade structures! Yet! TSIA wants to depend on the port, as part of their, proposed
aviation gas delivery system. Not to mention, also, the Port of Anchorage is in some of the most earthquake prone
areas, of the Anchorage, AK bowl.

Historical Dene/Athapaskan sites cover many miles, around the TSIA. Have you had input from the
Aboriginals, here? If not, when?

After reading up on this project, it is quite bias, as the State of Alaska, has too much control and seemingly, their 'own'
oversight. And, they are big stake-holders, a bias position.

The Muni. of Anchorage has some over-sight of pollutants, but they, too, are big stake-holders; another bias position.

Ted Steven's International Airport (TSIA) is operated by the State of Alaska,, D.O. T.
.
They have a 'dated' noise report from 2015. The State has high stakes involved and are bias for rushed development.

St. of Ak., Department of Conservation are to address water pollutants and attempt to

make corrective actions.  Again, it's the
State of Ak (major stakeholder)!  Bias, position again!

The EPA is also involved and will report their research to the Federal Aviation Administration (FAA)!  Lately the FAA
nationally, are understaffed, overworked, and seem to barely meet their own, central, requirements!
I have little confidence in their acuity, during these challenging times, of late.

The U.S. EPA for emissions related to aircraft are to become stricter *but not until 2023.*  Anchorage, Ak wreaks, daily of
aviation gas smell; its egregious, especially west of TSIA!  This March, I wanted to walk my dog near Raspberry Rd., and
I left after just 10 minutes, as it was so smelly, it made me feel unsafe to stay.

TSIA has stated in an email to me, on 6/15/2022, that they are not aware of any non-compliance to environmental laws,
And, that two main fuel suppliers currently pump millions of gallons of aviation gas *daily,* at TSIA.  Some gas is piped
in from across the inlet, and the rest is brought to Anchorage via the, currently, DILAPIDATED, Port of Anchorage.
Accountability here, seems to be another area, that is going unaddressed.
Logs of the amount of fuel coming into TSIA, fueling of planes, etc., could be tracked, as an oversight action, and
more careful records completed, as well.

Please give my concerns to those who may assist with being more transparent to the public and me.  This is such a bias
'plan', as it now!  Also, the public notice came out on 5/29/2022 with a short window of time to respond to such an ominous
project/never-done, ever-before, at that!  Why increase the industrial wasteland, that Anchorage is.

God bless you,
M. June Lonsdale
Dene Athapaskan
Anchorage Resident

# ANCHORAGE DAILY NEWS
## AFFIDAVIT OF PUBLICATION

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4041 B STREET, ANCHORAGE, AK 99503

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STATE OF ALASKA
THIRD JUDICIAL DISTRICT

Lisi Misa being first duly sworn on oath deposes and says that she is a representative of the Anchorage Daily News, a daily newspaper. That said newspaper has been approved by the Third Judicial Court, Anchorage, Alaska, and it now and has been published in the English language continually as a daily newspaper in Anchorage, Alaska, and it is now and during all said time was printed in an office maintained at the aforesaid place of publication of said newspaper. That the annexed is a copy of an advertisement as it was published in regular issues (and not in supplemental form) of said newspaper on

09/04/2023

and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is not in excess of the rate charged private individuals.

Lisi Misa

Signed______________________

Subscribed and sworn to before me
this 5th day of September 2023.

Jada L. Nowling

Notary Public in and for
The State of Alaska.
Third Division
Anchorage, Alaska

MY COMMISSION EXPIRES
2024-07-14

**DRAFT ENVIRONMENTAL ASSESSMENT AVAILABLE FOR PUBLIC COMMENT**

**NOTICE OF PUBLIC MEETING**

**Project Title: Alaska Cargo & Cold Storage Facility**

Alaska Cargo and Cold Storage, LLC, in cooperation with Ted Stevens Anchorage International Airport (ANC) and the Federal Aviation Administration (FAA) is soliciting comments on a Draft Environmental Assessment (EA) for proposal to construct cargo infrastructure at ANC in Anchorage, Alaska.

The proposed project will be incorporated into the ANC Airport Layout Plan and requires approval from the FAA and therefore is subject to the National Environmental Policy Act (NEPA). An environmental assessment has been prepared for the project to consider environmental impacts. The purpose of the proposed project is to develop infrastructure to support air cargo operations at ANC.

The proposed work requiring federal approval would include a new Aircraft Parking Apron, Cargo Warehouse, Cold Storage, Hardstand Fuel Distribution, Ground Support Equipment Shop and Parking, Ancillary/Control Space and Road Connection to Postmark Drive. Construction for the proposed project is anticipated to begin in fall 2023.

The purpose of the proposed project is to construct an energy-efficient, climate-controlled air cargo warehouse facility and hardstand parking for cargo jets at ANC. The purpose of the cargo facilities is to help improve cargo deplaning and enplaning efficiency, provide parking locations for cargo jets where they can power down, and build Alaska's economy.

To ensure that all possible factors are considered, please provide comments to the following locations by October 15, 2023. Written comments may be sent to Theresa Dutchuk at tdutchuk@dowl.com or comments by phone may be directed to (907) 865-1238.

The Draft EA and appendices are available for review at: https://dot.alaska.gov/anc/

Per the NEPA process, a public meeting will be held on October 3, 2023 from 4:00 to 6:00pm at the Spenard Community Recreational Center, Multi-Purpose room, 2020 W. 48th Avenue, Anchorage, AK 99517.

If you have any questions or require additional information, please contact Theresa Dutchuk, Environmental Specialist, (907) 865-1238 for information on project environmental impacts. Before including your address, phone number, e-mail address or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Pub: Sept. 4, 2023

Jada L. Nowling
ELECTRONIC NOTARY PUBLIC
STATE OF ALASKA
MY COMMISSION EXPIRES 07/14/2024

# DRAFT ENVIRONMENTAL ASSESSMENT AVAILABLE FOR PUBLIC COMMENT: Project Title: Alaska Cargo & Cold Storage Facility

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Leave a Comment

**Attachments, History, Details**

**Attachments**
None

**Revision History**
Created 9/8/2023 3:22:21 PM by camcdowell

**Details**

| | |
|---|---|
| Department: | Transportation and Public Facilities |
| Category: | Public Notices |
| Sub-Category: | Airport Leasing |
| Location(s): | Anchorage, Central Region, (ANC) Ted Stevens |

| | |
|---|---|
| | Anchorage International Airport |
| Project/Regulation #: | |
| Publish Date: | 9/8/2023 |
| Archive Date: | 10/15/2023 |
| Events/Deadlines: | |

## Theresa Dutchuk

**From:** Morgan McCammon
**Sent:** Thursday, September 7, 2023 3:41 PM
**To:** 'Info'
**Cc:** Theresa Dutchuk
**Subject:** Alaska Cargo and Cold Storage Notice of Draft EA Available and Public Meeting
**Attachments:** ACCS Draft EA NOA.pdf

Good afternoon,

Please see the attached notice of the Alaska Cargo and Cold Storage draft EA available for public comment and notice of public meeting. We would like this notice to go to Turnagain, Spenard, and Sand Lake Community Councils.

Thank you,

**Morgan McCammon**
Public Involvement Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1269 | direct
*dowl.com*

CARGO & COLD STORAGE
ALASKA

**DRAFT ENVIRONMENTAL ASSESSMENT AVAILABLE FOR PUBLIC COMMENT**

**NOTICE OF PUBLIC MEETING**

**Project Title: Alaska Cargo & Cold Storage Facility**

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To ensure that all possible factors are considered, please provide comments to the following locations by **October 15, 2023.** Written comments may be sent to Theresa Dutchuk at tdutchuk@dowl.com or comments by phone may be directed to (907) 865-1238**.**

The Draft EA and appendices are available for review at: https://dot.alaska.gov/anc/

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# Alaska Cargo & Cold Storage Facility

## NOTICE OF PUBLIC MEETING


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# Public Meeting - <u>Corrected Date</u>

When:

**<u>Tuesday, October 3, 2023</u> | 4:00 - 6:00 p.m.**

Where:

**Spenard Community Recreational Center: Multi-Purpose Room**
**2020 W. 48th Avenue, Anchorage, AK 99517**

To ensure that all possible factors are considered, please provide comments to the following locations by **October 15, 2023**.

**Theresa Dutchuk**

tdutchuk@dowl.com (907) 865-1238

The Draft EA and appendices are available for review at:
**https://dot.alaska.gov/anc/**

If you have any questions or require additional information, please contact Theresa Dutchuk, Environmental Specialist, (907) 865-1238 for information on project environmental impacts. Before including your address, phone number, e-mail address or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

**DOWL**
Attn: Public Involvement
5015 Business Park Boulevard, Suite 4000
Anchorage, AK 99503

CARGO & COLD STORAGE
ALASKA

# Alaska Cargo & Cold Storage Facility Open House Meeting Summary

Tuesday, October 3, 2023 | 4:00 – 6:00 p.m.
*Spenard Community Recreational Center, Multi-Purpose Room*
*2020 W. 48th Avenue, Anchorage, AK 99517*

The open house was held in-person at the Spenard Community Recreation Center in the Multi-Purpose Room. The first attendees arrived on time at 4:00 p.m. The meeting format was open house style, with no formal presentation. Attendees were greeted at the sign in table with a project fact sheet. Project boards lined the perimeter of the room detailing proposed action, air quality, biological resources, hazardous materials, wetlands, and information on how to view the Draft EA or submit a comment. One participant filled out a written comment form at the comment table.

Members of the project team were available throughout the meeting to answer questions about the Draft EA. Ten people signed in, including members of the project team.

## Summary of Comments Received During the Open House

- Consider including electrical connections on the hard stands so the auxiliary power unit (APU) can be shut off to decrease ground noise, emissions, and fuel use.
- Consider adding a berm on Postmark Drive to reduce ground noise.
- Concerns with increased truck traffic coming near neighborhoods on West Northern Lights Boulevard.
- Concerns about wetland mitigation and the reduced size of Postmark Bog.
- Concerns about PFAS contamination.
- Consider conducting a cumulative noise study for all the facilities in the north air park.
- Concerns with airport expansion adding to increased noise and poor air quality.

## Summary of Questions Received During the Open House

- One participant asked where the decibel study was done and how it was measured.
- One participant asked how the planes will use pull-through lanes.
- One participant asked why the Cargo & Cold Storage Draft EA is so much shorter than the FedEx Draft EA.

**CARGO & COLD STORAGE**
**ALASKA**

# SIGN IN SHEET
## Public Meeting
Tuesday, October 3, 2023

| PRINT NAME | EMAIL | PHONE NUMBER |
|---|---|---|
| Talli Vittetoe | tvittetoe@dowl.com | 907-562-2000 |
| Kristi Ponuzzo | ~~Ponuzzo~~. kristi.m.ponuzzo@faa.gov | |
| Cathy Gleason Turnagain Comm. Council | cathy.gleasontcc@yahoo.com / tccpresident@yahoo.com | 907-248-0442 |
| Daniel Gleason TCC | dan.gleason@hotmail.com | 907-980-1958 |
| CRAIG CAMPBELL | CRAIG.CAMPBELL@ALASKA.GOV | 907-444-4212 |
| JASON GAMACHE | JGAMACHE@ ~~@~~ EXPLOREDESIGN.COM | 907.231.1117 |
| Bill O'Connell | bill.OConnell@alaska.gov | 907-269-3057 |
| John Johansen | john.johansen@alaska.gov | 907 748 2015 |
| Jon Isaacs | isaacs@gci.net | 907 223 1959 |
| Theresa Dutchuk | tdutchuk@DOWL.com | 907 562 2000 |
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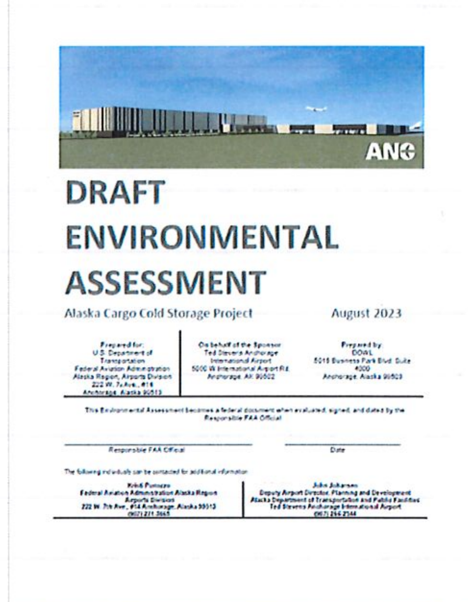
CARGO & COLD STORAGE
ALASKA

# COMMENTS SHEET

**Please share your comments on the Draft Environmental Assessment.**


ANC

DRAFT
ENVIRONMENTAL
ASSESSMENT

Alaska Cargo Cold Storage Project August 2023

Please put in the
electrical connections
on the hard stands
so the APU's can
be shut off.
Ground Noise, emissions,
and fuel usage will
all be reduced.

The Draft EA and appendices are available for review at: https://dot.alaska.gov/anc/

Written comments may be sent to Theresa Dutchuk at tdutchuk@dowl.com or comments by phone may be directed to (907) 865-1238.

**38.63279.01**
**Alaska Cargo and Cold Storage Draft EA Public Comment Log**

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| 1 | 10/3/2023 Written, Public Meeting | None | Please put in the electrical connections on the hard stands so the APU's can be shut off. Ground noise, emissions, and fuel usage will be reduced. | 10/3/2023 Electrical connections will be considered during final design of the facility. | 3.2 Air Quality, 3.7 Noise, 3.1 Energy Supply | Noise, jet emissions, energy supply. |
| 2 | 10/3/2023 Verbal, Public Meeting | None | Consider adding a berm on Postmark Drive to reduce ground noise. | 10/3/2023 Although a berm is not required to mitigate impacts, a berm will be considered during final design of the facility. | 3.7 Noise, Appendix D | Noise |
| 3 | 10/3/2023 Verbal, Public Meeting | None | Concerns with increased truck traffic coming near neighborhoods on West Northern Lights Boulevard. | 10/3/2023 The Proposed Action will not meaningfully impact traffic conditions in the area because the cargo facility is expected to largely operate as enplaning and deplaning cargo on-site, not deplaning for in-state ground transportation. Deplaning cargo for local transport is expected , but very limited and not daily. | 1.1 Purpose and Need, 3.1 Socioecon omics | Traffic |
| 4 | 10/3/2023 Verbal, Public Meeting | None | Concerns about wetland mitigation and the reduced size of Postmark Bog. | 10/3/2023 Wetland mitigation is being applied to compensate for the lost functions and values of Postmark Bog. A USACE Individual Permit was issued June 30, 2023 including compensation requirements for impacts to 21.6 acres of wetlands. | 3.9 Wetlands | Wetlands |
| 5 | 10/3/2023 Verbal, Public Meeting | None | Concerns about PFAS contamination. | 10/3/2023 Remediation of PFAS contamination is being coordinated with ADEC. Techniques such as granulated active carbon barriers are proposed to prevent PFAS from migrating off-site. More information | 3.5 Hazardous Materials, Appendix B | Contamination |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | | can be found in the contaminated materials management plan (Appendix B), which will require approval from ADEC prior to construction. | | |
| 6 | 10/3/2023 Verbal, Public Meeting | None | Consider conducting a cumulative noise study for all the facilities in north airpark. | 10/3/2023 ANC is currently updating their Master Plan which will include a Title 14 of CFR Part 150 Noise Compatibility Analysis. The Noise Exposure Maps will provide a cumulative impact for airport-wide decibel levels. Please refer to EA Section 3.7.2.2 for a review of cumulative noise impacts. | 3.7 Noise | Noise |
| 7 | 10/3/2023 Verbal, Public Meeting | None | Concerns with airport expansion adding to increased noise and poor air quality. | 10/3/2023 Airport-wide analyses are completed during the Master Planning process. A cumulative effects analysis was completed for the proposed project. The proposed project does not have direct or indirect noise effects that require additional review under FAA Order 1050.1F.<br><br>ANC currently has an air quality permit and reporting requirements with ADEC. Because there is a threshold for emissions at ANC, cumulative impacts are capped at an approved ADEC rate. | 3.2 Air Quality, 3.7 Noise | Air Quality and Noise |
| 8 | 10/3/2023 Verbal, Public Meeting | None | Where was the noise study done and how was the noise measured? | 10/3/2023 The noise review was completed using the FAA Airport Equivalent Method screening tool and completed by a licensed acoustical | 3.7 Noise, Appendix D | Noise |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | | engineer and the report is located in Appendix D. Decibels are measured as a day-night average, or DNL, as required by FAA. The acoustical engineer used an Area Equivalent Method screening analysis to determine if a more robust modeling analysis was needed to quantify impacts. The screening analysis indicated that further noise impact analysis was not warranted, in accordance with FAA Order 1050.1F. | | |
| 9 | 10/3/2023 Verbal, Public Meeting | None | How will the planes use pull-through lanes? | 10/3/2023 A tug will be used to push back the jets from their nose-first parking position so they can taxi nose first onto the taxiway. | 2.2 Proposed Action | Project Description |
| 10 | 10/3/2023 Verbal, Public Meeting | None | Why is the ACCS Draft EA so much shorter than the FedEx Draft EA? | 10/3/2023 The document is compliant with CEQ page requirements and has separate appendices attached with more detailed information.. | N/A | N/A |
| 12 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "With regard to project description, Appendix E provides much more detail on proposed facilities and design that is absent from Chapter 2 and needed to understand potential impacts. Those more detailed schematics should be included in Chapter 2." | 10/18/2023 Added reference in Chapter 2 for the reader to refer to Appendix E for concept level engineering drawings. | 2.2 Proposed Action | Project Description |
| 13 | 10/17/23, Email | Turnagain Community Council, Cathy | [Excerpt] "Similarly detail on how contaminated groundwater is intercepted and treated is "buried" on page 457 of Appendix B. This information should be better | 10/18/2023 An overview of the cleanup methodology is included in the Hazardous Materials section of the EA, Chapter 3. Chapter 3 is traditionally used to describe specific | 3.5.2 | Hazardous Materials |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | Gleason, Jon Isaacs | summarized in Chapter 2, with reference to the appropriate Section of Appendix B." | resource categories such as hazardous materials. Chapter 2 is traditionally used to review and describe alternatives. | | |
| 14 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "Finally, there is no information on the nature and duration of construction activities including how construction equipment and heavy truck traffic will access the site." | 10/18/2023 Construction of the proposed facility and FedEx is expected from 2024-2026. Construction may to overlap.<br><br>Additional information on construction impacts has been added to 3.1 Socioeconomics (traffic), 3.2 Air Quality, and 3.7 Noise. | 3.1 Socioeconomics, 3.2 Air Quality, 3.7 Noise | Construction Impacts |
| 15 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "…we find that some potential impacts that affect adjacent neighborhoods have not been addressed (construction and heavy truck traffic), have been dismissed without justification (air quality), understated by comparing them on airport-wide scale and ignoring site specific impacts on adjacent neighborhoods (noise), lack of details (treatment of PFAS contaminated ground water), and commitments to mitigation (providing electric power to hard stands and avoiding use of auxiliary power units [APU] which reduces noise and air emissions) are unclear. The assessment of cumulative impacts is likewise | 10/18/2023 Construction impacts are discussed specific to the adjacent neighborhoods in 3.7.2.<br><br>Traffic impacts are not expected and are discussed in 3.1.<br><br>Future air quality impacts would be related primarily to new ground service equipment introduced to support the new parking positions. Ground service equipment are not expected to cause substantial amounts of criteria air pollutants. The EPA has provided GSE emissions rates per hour (EPA 1999) and they are in the tens of grams per hour. Not sufficient to reach 159.3 tons.day, which would be considered regionally | 3.7.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0 | Construction impacts, noise, air quality, hazardous materials, cumulative impacts, environmental commitments, wetlands. |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | deficient, particularly with regard to wetlands." | significant per the FAA Environmental Desk Reference (FAA 2020) Treatment of PFAS is summarized in Section 3.5.2, specific details are outlined in the contamination materials management plan found in Appendix B.<br><br>Although additional considerations may be added such as electric in ground power to mitigate the use of APUs, current environmental commitments are described in 4.0.<br><br>Additional information on cumulative impacts has been added to air quality, hazardous materials, historic and cultural resources, noise, visual resources, and water resources. In particular regarding cumulative impacts on wetlands the USACE cumulative analysis findings has been added to this EA. | | |
| 16 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "we remain dismayed that mitigation for the fill of Postmark Bog wetlands relies on offsite mitigation and credits, and not require on-site mitigation through setting aside adjacent Turnagain Bog wetlands, which would preserve wetland functions and values both on the | 10/18/2023 Wetland mitigation is being applied to compensate for the lost functions and values of Postmark Bog.<br><br>The Corps can only require that adequate and appropriate compensatory mitigation be completed but cannot direct the any | 3.9 | Wetland impacts, compensatory mitigation, water resources |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | airport and affecting adjacent waters of the United States.” | applicant to provide any specific compensatory mitigation. The applicant must provide a compensatory mitigation proposal to the Corps, and the Corps must evaluate the proposal for sufficiency. Therefore, the Corps cannot require that the applicant preserve a portion of the Turnagain Bog wetlands as a part of their compensatory mitigation requirements.<br><br>A USACE Individual Permit was issued June 30, 2023 including compensation requirements for impacts to 21.6 acres of wetlands. The decision document, including the USACE findings of the proposed action is available upon request from the USACE. Permit number POA-2021-00121. Please refer to Section 3.9 for a discussion of impacts to water resources which provides a more detailed analysis. | | |
| 17 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] “The proposed approximately 30-acre Alaska Air Cargo Cold Storage facility will pose additional impacts to this Class A wetland that need to be addressed in the Final EA. While we recognize that the Class A wetlands on the project site are degraded in function and value, and contaminated with | 10/18/2023 The USACE is responsible for assessing impacts to waters of the U.S. The USACE is also responsible for addressing losses in wetland functions and values. The USACE reviewed the proposed project and assigned mitigation, leading to an issuance of a permit for the proposed action. The USACE has | 3.9 | Wetlands, cumulative impacts |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | PFAS and hydrocarbons as stated in the EA, the primary function of the Postmark Bog wetland is stormwater runoff attenuation from airport impervious surfaces. How the loss of these wetlands affects storm water attenuation should be addressed. Considering the multiple cargo facilities that have already been developed at North AirPark in Postmark Bog — as well as the proposed FedEx lease application for expansion of its facility also currently out for public comment would abut the proposed Alaska Air Cargo Cold Storage project— the cumulative impacts to Postmark Bog have been substantial, and are not adequately evaluated in the Draft EA, particularly the effects on stormwater runoff attenuation." | also issued a permit for the FedEx proposed action. Additional information on cumulative impacts to Postmark Bog have been added to the cumulative impacts section of 3.9. Functions lost such as stormwater runoff attenuation, are addressed through compensatory mitigation which is a mechanism of the USACE's discretion to preserve or replace wetland functions and values lost to permanent impacts.<br><br>Please refer to the cumulative impact analysis, which has been updated to include the USACE's analysis in Section 3.9. | | |
| 18 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "There doesn't appear to be a stand-alone section on surface and groundwater hydrology, but is addressed to some degree under Wetlands. Given that an impervious surface will be constructed over what is currently wetlands functioning as storm water retention, it is unclear what will be changes and impacts to surface water drainage. If the existing stormwater drainage infrastructure from the site will be | Storm water runoff resulting from the addition of an impervious surface would flow into a culvert under North Tug Road which connects to a storm drainpipe that discharges directly into Knik Arm. The discharge of stormwater from airport property is regulated under Clean Water Act Section 402 through an Alaska Pollutant Discharge Elimination System permit. This language has | 3.9, 3.5, Appendix B | Stormwater runoff, hazardous materials, cumulative impacts |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | maintained, this needs to be described and potential impacts assessed, included treatment of surface water runoff from the proposed facility.<br><br>The Draft EA indicated that potentially contaminated groundwater will be captured through a granular activated carbon filter; however, it is unclear how and how long this actually works. Does the activated carbon filter work in perpetuity, or does it need replacement and what happens to the filter that is replaced? In addition, we would recommend that water quality well monitoring be conducted "downstream" of the activated carbon filter to make sure that is adequately capturing an PFAS contamination.<br><br>Finally, cumulative impacts on water quality and hydrology are not adequately addressed and put into context." | been added to Section 3.9, Water Resources<br><br>Detail regarding contamination mitigation is provided in Appendix B. An approved contamination materials management plan provides specific detail regarding carbon filters and cleanup methodology. Although the plan is preliminarily approved by ADEC, another round of approval will be required prior to issuance of an excavation dewatering permit.<br><br>Adverse impacts to water quality are not expected. The water is currently contaminated and will benefit from remediation. The contaminated source will be capped with an impervious surface resulting in less contaminated water entering the stormdrain system and less contaminated water runoff entering Cook Inlet. Cumulative impacts to water quality are not expected because there are no adverse impacts. Overall water quality is expected to benefit from PFAS remediation. | | |
| 19 | 10/17/23, Email | Turnagain Community Council, Cathy | [Excerpt] "With development of additional cargo-related operations in NorthAir Park — including the proposed Alaska Air Cargo Cold | 10/18/2023 Airport staff consults with the Municipality of Anchorage and ADEC concerning CO and other air | 3.2 | Air Quality |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | Gleason, Jon Isaacs | Storage facility as well as expansion of the FedEx facility — cumulative and negative health impacts to our air quality and inhalation and exposure to jet fumes generated by these cargo facilities will only increase, affecting the health and well-being of residents in our community. The impact analysis concludes that overall airport air quality impacts may not increase; however, it moves additional sources of air emissions closer to Turnagain Neighborhoods, and this should be acknowledged. Providing electric power supply to aircraft hardstands and elimination of APUs will reduce air quality impacts from the proposed development and should be required." | quality issues. The Airport currently operates under an "Owner Requested Limit" permit under the state's air quality regulations (Alaska Statute 46.14 and 18 AAC 50.225). Under this permit, the Airport submits an annual report to the ADEC to document that the Airport complies with the regulations and did not have any excess emissions or deviations from its permit.<br><br>The project proponent is considering in-ground power to reduce the amount of time that aircrafts need to use APUs. | | |
| 20 | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "Turnagain residents have also been subjected to a significant increase in cargo plane-related ground noise. Turnagain (as well as other West Anchorage) residents started complaining about 24/7 ground noise coming from this Airport area. Noises included aircraft taxing, engine run-ups, use of APUs, and other whining, loud sounds.<br><br>The impact analysis needs to recognize that while overall airport | 10/18/2023 ANC is currently updating their Master Plan which will include a Title 14 of CFR Part 150 Noise Compatibility Analysis. The Noise Exposure Maps will provide a cumulative impact for airport-wide decibel levels. The Noise compatibility analysis includes consideration of complaints.<br><br>As reported in the Airport's FAR Part 150 Compatibility Study Update, a semi-permanent noise monitor was | 3.7 | Noise, cumulative impacts |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | noise may not increase due to an assumption that the proposed project will not in an increase in the overall number of planes that use the Airport facilities, the development of additional aircraft parking on the eastern boundary of the property will generate more noise that can be experienced in Turnagain neighborhoods on the eastern boundary of the airport. Electric power supply needs to be incorporated into the hardstands to eliminate the use of APUs and the noise they generate. The project needs to construct a noise berm or something similar along the Postmark Drive side of the property to mitigate noise. These have been constructed along other portions of Postmark Drive. The potential for cumulative noise related impacts has also not been adequately addressed." | set up at 3190 Bridle Lane, which is at the approximate location of the nearest residential land use to the project study area (ANC 2015). The ambient noise at this monitoring site was recorded at 59.3 dB in the winter and at 64.9 dB in the summer. Therefore, due to the distance from the closest sensitive noise receptor, noise attenuation from the project study area, and typical ambient noise levels, construction noise would not likely be perceptible at the nearest residence to the project study area.<br><br>The project proponent is considering the addition of in-ground power sources for aircrafts. | | |
| | 10/17/23, Email | Turnagain Community Council, Cathy Gleason, Jon Isaacs | [Excerpt] "Turnagain residents have seen a significant increase in airport-related heavy traffic on WNL. This has been a long-term concern for TCC and our community as the Airport has grown over time. How construction and operated truck traffic will be managed does not seem to be addressed in the EA, | 10/18/2023 The Proposed Action will not meaningfully impact traffic conditions in the area because the cargo facility is expected to largely operate as enplaning and deplaning cargo on-site, not deplaning for in-state ground transportation. Deplaning cargo for local transport is expected , but very limited and not daily. | 3.1 | Socioeconomics, traffic |

| Comment Number | Comment Date/ Type | Name | Comment | Comment Response/Date | Topic Location in E.A. | Comment Theme(s) |
|---|---|---|---|---|---|---|
| | | | along with any potential impacts if they were to use WNL to access the site.<br><br>With development of additional cargo-related construction and operations in NorthAir Park — including the proposed Alaska Air Cargo Cold Storage facility as well as expansion of the FedEx facility — cumulative health and safety impacts generated by airport-related heavy truck traffic will only increase and need to be addressed.<br><br>Finally, mitigation should require that all heavy truck and construction equipment traffic associated with project, including construction and operations, avoid using WNL and use International Airport Road as an approved truck route." | | | |

# APPENDIX G:

# AGENCY SCOPING

## TABLE OF CONTENTS

| | |
|---|---|
| **From:** | Theresa Dutchuk |
| **To:** | sandra.moller@alaska.gov; cindy.christian@alaska.gov; dec.webmaster@alaska.gov; tiffany.larson@alaska.gov; jim.rypkema@alaska.gov; rebecca.colvin@alaska.gov; katrina.chambon@alaska.gov; sam.kito@alaska.gov; cynthia.wardlow@alaska.gov; csp@alaska.gov; oha.revcomp@alaska.gov; judith.bittner@alaska.gov; sturges.susan@epa.gov; ak_fisheries@fws.gov; tom.davis@anchorageak.gov; WeedCJ@muni.org; ellissm@muni.org; bunnellKR@muni.org; patricia.maxwell@anchorageak.gov; matthew.stichick@anchorageak.gov; jbrune@ciri.com; kfoster@eklutnainc.com; faithr@eklutna.org; Pagemaster, Reg POA |
| **Cc:** | Teri Lindseth; Matt VanGoethem; Jason Gamache; Joe Jacobson; Gilbertsen, Jack (FAA) |
| **Subject:** | Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport |
| **Date:** | Friday, June 10, 2022 1:00:00 PM |
| **Attachments:** | ACCS Agency Scoping Letter .pdf |

Hello Agency Contacts,

Please find attached scoping materials and request for comments regarding the Alaska Cargo and Cold Storage project at Ted Stevens Anchorage International Airport.

Some of you may have already begun coordination with the project team. The project recently entered into the National Environmental Policy Act (NEPA) process under the Federal Aviation Administration and this request for comment is a part of the NEPA regulatory process.

Please don't hesitate to reach out with any questions or comments.

Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

(907) 562-2000 | office
(907) 865-1238 | direct

*dowl.com*

Dear Agency Staff,

Alaska Cargo and Cold Storage, LLC, in cooperation with the Federal Aviation Administration (FAA) is soliciting comments and information on a proposal to construct cargo infrastructure at Ted Stevens Anchorage International Airport (ANC) in Anchorage, Alaska. The proposed project is located in Anchorage, Alaska (61.18407 North latitude, -149.99577 West longitude; Section 28, Township 13N, Range 4W, Seward Meridian, USGS Quad Tyonek Anchorage A-8 NW) (Figure 1).

The proposed project will be incorporated into the ANC Airport Layout Plan and require approval from the FAA and therefore is subject to the National Environmental Policy Act (NEPA). DOWL has been selected to do the NEPA analysis. An environmental assessment is being prepared for the project to consider any environmental impacts. The purpose of the proposed project is to develop infrastructure to support air cargo operations at ANC.

The proposed work requiring federal approval would include:

- New Aircraft Parking Apron
- Cargo Warehouse
- Cold Storage
- Hardstand Fuel Distribution
- Ground Support Equipment Shop and Parking
- Ancillary/Control Space
- Road Connection to Postmark Drive

DOWL conducted preliminary research using the most current available data to identify potential environmental resources within the proposed project vicinity. The results can be found in the attached Preliminary Environmental Research document (Appendix A).

To ensure that all factors are considered in developing the proposed project, please provide your written comments, recommendations, and requests for additional information to the contacts below no later than July 15, 2022.

If you have any questions on the environmental effects, please contact me with the contact information listed below. Questions concerning the engineering aspects of the proposed project can be directed to Jason Gamache, Project Manager, at (907) 563-8474 or via email at jgamache@exloredesign.com.

Thank you,

Theresa Dutchuk

Theresa Dutchuk
Senior NEPA Specialist
DOWL
tdutchuk@dowl.com
(907) 865-1238

Attachments:

Figure 1 Vicinity Map
Preliminary Environmental Research

cc: Joe Jacobson, Vice President, McKinley Alaska Private Investment, LLC
Matt VanGoethem, Construction Manager, MCG Explore Design
Jason Gamache, Project Manager, MCG Explore Design
Teri Lindseth, Planning Manager, ANC

Q:\38\63279.01\65CAD\Civil\ModelFiles\Figures\Wetland Figures\SC20-CS-COVER-Wetland.dwg PLOT DATE 2022-3-11 10:25 SAVED DATE 2021-10-12 19:51 USER: wlaws

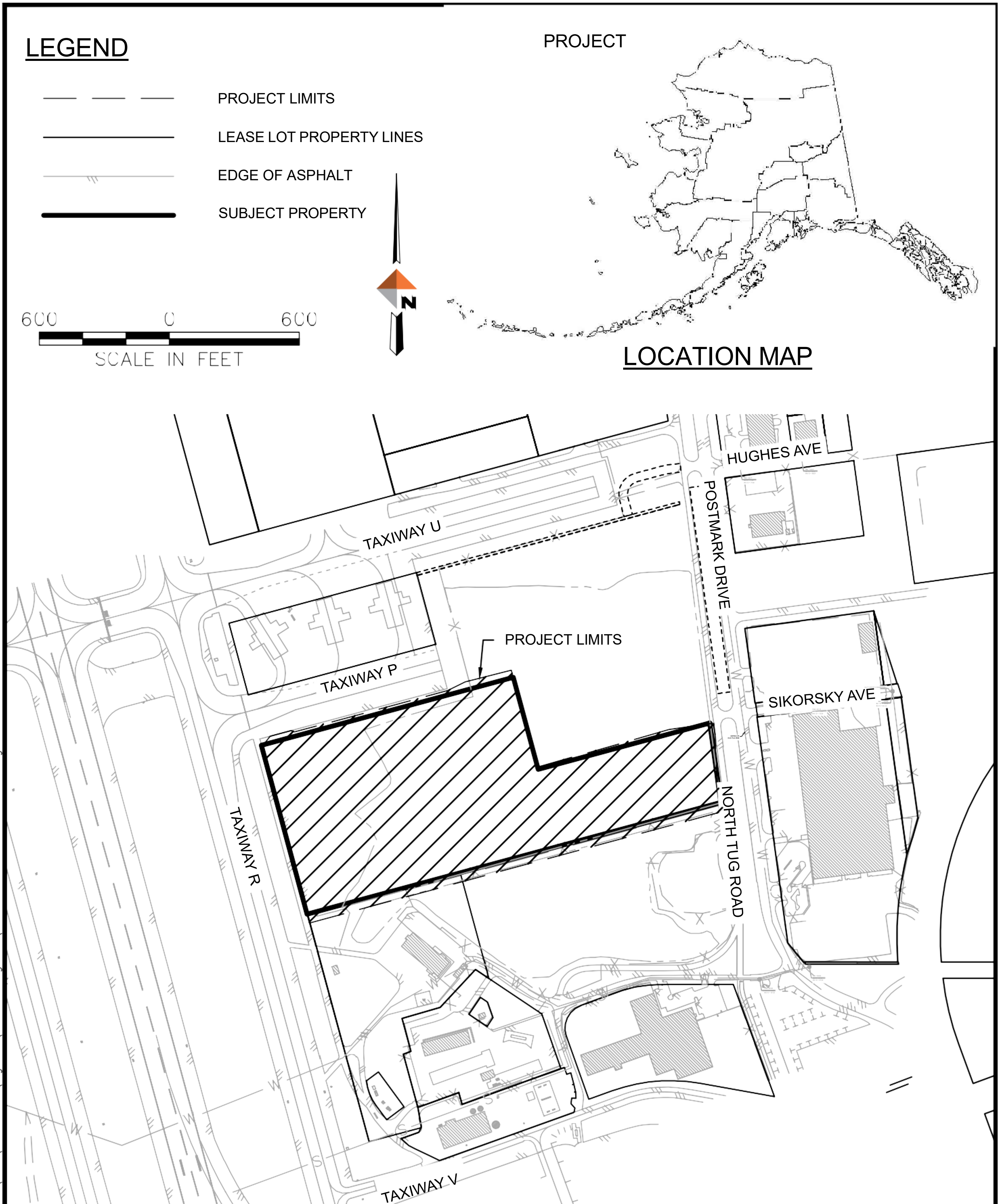



Figure 1.0

DOWL
WWW.DOWL.COM
AECL848
4041 B Street
Anchorage, Alaska 99503
907-562-2000

ALASKA CARGO & COLD STORAGE
VICINITY MAP

PROJECT: PO--2021-00121
KNIK -RM
D-TE 03/11/2022

FIGURE 1.0

June 10, 2022

Subject: **PRELIMINARY ENVIRONMENTAL RESEARCH**

Alaska Cargo Cold Storage Project

## Air Quality[i]

Per the Alaska Administrative Code (AAC) 18 AAC 50.15, the Municipality of Anchorage is considered a Class III area, subject to maintenance plan requirements for carbon monoxide as stated in 18 AAC 50.030. Impacts to air quality during construction are anticipated to be minimal and temporary. No long-term impacts to air quality are anticipated. Implementation of the Proposed Action may reduce delay for arriving aircrafts (i.e. less taxi) and could prove beneficial from an air quality perspective (i.e. emissions would be reduced).

## Biological Resources

Endangered Species Act (Threatened or Endangered Species)[ii]

A search of the United States Fish & Wildlife Services (USFWS) Information for Planning and Conservation (IPaC) online database on June 10, 2022 indicates there are no threatened or endangered species within the project limits.

Critical Habitat Areas[2]

USFWS IPaC indicates there are no officially designated critical habitat areas within the project limits.

Migratory Birds and Eagle Nests[iii]

According to the USFWS online mapper of documented eagle nest sites, the closest observation is approximately 0.75-mile northwest of the project area. Fish and wildlife are a hazard to aviation and the US Department of Agriculture Wildlife Services is responsible for identifying and removing wildlife hazards, such as migratory bird and eagle nests.

Essential Fish Habitat[iv & v]

The Magnuson-Stevens Fisheries Conservation and Management Act (1996) defines essential fish habitat (EFH) as …"waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." According to the National Ocean and Atmospheric Administration (NOAA) online database, there is no EFH or Habitat or Particular Concern in the waterbody nearest the project area: Lake Hood/Spenard. Additionally, as no-in water work is proposed, impacts to Lake Hood/Spenard are not anticipated. A review of the Alaska Department of Fish & Game's Anadromous Waters Catalog indicates Lake Hood/Spenard is not anadromous.

Marine Mammal Protection Act

Marine mammals are present within the Anchorage area in Cook Inlet, located approximately one mile west of the project area. However, no waterwork is proposed and construction noise is not near enough habitat to cause an impact; as such, impacts to marine mammals as a result of the proposed project are not anticipated.

Invasive Species[vi]

According to the University of Alaska Anchorage (UAA) Alaska Exotic Plants Information Clearinghouse (AKEPIC) Data Portal on June 10, 2022, there are no invasive plant species within the project area.

## Estimated Ground Disturbance and Clearing Activities

The proposed project's total disturbed area is 32 acres including a 29-acre concrete pad. The contractor would obtain coverage under the 2021 ADEC Pollutant Discharge Elimination System (APDES) Construction General Permit (CGP) prior to construction.

## Floodplains[vii]

A review of the Federal Management Agency (FEMA) National Flood Hazard Layer FIRMette #0200050740D (revised 9/25/2009) indicated that the project is located within Zone X which is an area of minimal flood hazard potential. No floodplain encroachments are expected as a result of the project.

## Hazardous Waste[viii]

A review of the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites database on June 10, 2022, indicated there are two active sites, one cleanup complete with institutional controls (IC), and nine cleanup complete sites within 1,500 feet of the proposed project (Table 1). A Phase 1 Environmental Site Assessment concluded that the site is likely contaminated with Perfluorooctanoic acid (PFOA); Perfluorooctanesulfonic acid (PFOS); diesel range organic compounds; residual range organics; and benzene, toluene, ethylbenzene and xylene. Coordination with ADEC is ongoing.

**Table 1: Contaminated Sites within 1,500 feet of the Proposed Project**

| Hazard ID | Site Name | Status | Contamination Type |
|---|---|---|---|
| 26519 | AIA Tanks #19, 20, 21 | Active | Petroleum |
| 27137 | AIA Aircraft Rescue and Fire Fighting Bldg PFAS | Active | Per- and Polyfluoroalkyl Substances (PFAS) and Petroleum |
| 2009 | AFSC AIA Former Fuel Vault | Cleanup Complete- IC | Petroleum |
| 24719 | Village Aviation | Cleanup Complete | Petroleum |
| 23883 | AIA Tank #22 | Cleanup Complete | Petroleum |

| | | | |
|---|---|---|---|
| 24710 | AIA Tank #20 | Cleanup Complete | Petroleum |
| 24709 | AIA Tank #23 | Cleanup Complete | Petroleum |
| 23174 | Federal Express ANCR Facility | Cleanup Complete | Petroleum |
| 24891 | USPS – GMF | Cleanup Complete | Petroleum |
| 24058 | International In-Flights Catering Company | Cleanup Complete | Petroleum |
| 24034 | USPS – Anchorage General Mail Facility | Cleanup Complete | Petroleum |
| 1468 | AIA Walker Pre-Flight Area | Cleanup Complete | Petroleum |

## Historic Resources

A review of the Alaska Heritage Resource Survey (AHRS) mapper conducted June 10, 2022 indicated that there are no AHRS sites located within the project area. Much of the project area has been previously disturbed indicating the likelihood of encountering buried historic resources is low. Project development will proceed in accordance with Section 106 of the National Historic Preservation Act.

## Recreational Facilities

The proposed project is located within airport property. A review of the Municipality of Anchorage Park and Facility Information Mapper and the Alaska Department of Natural Resources Alaska Mapper indicated no recreational resources or facilities are located adjacent the project area.

## Water Quality and Supply, Sole Source Aquifer[ix]

A search of the ADEC drinking water mapping application indicates there are no drinking water protections areas within one mile of the project. A search of Environmental Protection Agency's sole source aquifers indicates there are no such resources in Alaska.

The project proposed to surcharge land saturated with PFOS and/or PFOA contaminated waters. Proper management of contaminated water runoff resulting from the land surcharging will be coordinated with ADEC.

## Wetlands[x,xi]

A review of the Municipality of Anchorage Wetlands Mapper on June 10, 2022 indicated there are Class A high value wetlands within the boundaries of the project. Additionally, a National Wetland Inventory review conducted on the same day identified three wetland areas. Interpretation of satellite imagery by a Professional Wetland Scientist confirms wetlands are potentially present within the project area. The project will proceed in accordance with E.O. 11990, Protection of Wetlands and Clean Water Act Section 404 permitting.

## Permits and Authorizations

Permits for the proposed work may include:

- ADEC Alaska Pollutant Discharge Elimination System Construction General Permit
- MOA Noise Permit
- USACE Section 404 Permit (submitted – in agency review)
- ADEC Section 401 Certification (submitted – in agency review)
- Alaska Department of Natural Resources State Historic Preservation Office, Section 106 Concurrence

## REFERENCES


[i] (http://dec.alaska.gov/air/index.htm). Accessed June 10, 2022.
*Department of Environmental Conservation 18 AAC 50 Air Quality Control*. DEC, 2020.

[ii] (https://ipac.ecosphere.fws.gov/). Accessed June 10, 2022

[iii] Documented Eagle Nest Sites | Documented Eagle Nest Sites | Southeast Alaska GIS Library (arcgis.com). Accessed June 10, 2022

[iv] (https://www.habitat.noaa.gov/apps/efhmapper/?page=page_2). Accessed June 10, 2022

[v] https://aknhp.uaa.alaska.edu/apps/akepic/#map?lg=f37ef462-d080-11e3-a36b-00219bfe5678&z=15&ll=61.18411%2C-149.97988. Accessed June 10, 2022

[vi] https://aknhp.uaa.alaska.edu/apps/akepic/#map?lg=f37ef462-d080-11e3-a36b-00219bfe5678&z=15&ll=61.18411%2C-149.97988. Accessed June 10, 2022

[vii] (https://msc.fema.gov/portal/search?AddressQuery=Anchorage%2C%20AK#searchresultsanchor. Accessed June 10, 2022

[viii] Alaska DEC Contaminated Sites (arcgis.com). Accessed June 10, 2022

[ix] (https://adec.maps.arcgis.com/apps/mapviewer/index.html?webmap=13ed2116e4094f9994775af9a62a1e85). Accessed June 10, 2022

[x] https://muniorg.maps.arcgis.com/apps/webappviewer/index.html?id=f0bef139a7584820ad9d60c9eeea8a5f. Accessed June 10, 2022

[xi] https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed June 10, 2022

## Theresa Dutchuk

**From:** Colvin, Rebecca A (DEC) <rebecca.colvin@alaska.gov>
**Sent:** Tuesday, June 14, 2022 8:13 AM
**To:** Theresa Dutchuk
**Subject:** [EXT] RE: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

You don't often get email from rebecca.colvin@alaska.gov. Learn why this is important

**WARNING:** *External Sender - use caution when clicking links and opening attachments.*

Good Morning,

There are no known solid waste sites in the project location. ADEC Solid Waste Program has no comments on the proposed project at this time.

Rebecca Colvin
Program Coordinator
Solid Waste Program
Alaska Department of Environmental Conservation 907-269-7802

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, June 10, 2022 1:00 PM
**To:** Moller, Sandra (CED) <sandra.moller@alaska.gov>; Christian, Cindy L (DEC) <cindy.christian@alaska.gov>; DEC-Webmaster (DEC sponsored) <DEC.Webmaster@alaska.gov>; Larson, Tiffany M (DEC) <tiffany.larson@alaska.gov>; Rypkema, James (DEC) <james.rypkema@alaska.gov>; Colvin, Rebecca A (DEC) <rebecca.colvin@alaska.gov>; Chambon, Katrina M (DEC) <katrina.chambon@alaska.gov>; Kito, Sam (DEC) <sam.kito@alaska.gov>; Wardlow, Cynthia M (DFG) <cynthia.wardlow@alaska.gov>; DNR, DNR Parks Chugach State Park (DNR sponsored) <csp@alaska.gov>; DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>; Bittner, Judith E (DNR) <judy.bittner@alaska.gov>; sturges.susan@epa.gov; ak_fisheries@fws.gov; tom.davis@anchorageak.gov; WeedCJ@muni.org; ellissm@muni.org; bunnellKR@muni.org; patricia.maxwell@anchorageak.gov; matthew.stichick@anchorageak.gov; jbrune@ciri.com; kfoster@eklutnainc.com; faithr@eklutna.org; Pagemaster, Reg POA <regpagemaster@usace.army.mil>
**Cc:** Lindseth, Teri D (DOT) <teri.lindseth@alaska.gov>; Matt VanGoethem <mvangoethem@exploredesign.com>; Jason Gamache <jgamache@exploredesign.com>; Joe Jacobson <jjacobson@mckinley-alaska.com>; Gilbertsen, Jack (FAA) <jack.gilbertsen@faa.gov>
**Subject:** Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

**CAUTION:** This email originated from outside the State of Alaska mail system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Agency Contacts,

Please find attached scoping materials and request for comments regarding the Alaska Cargo and Cold Storage project at Ted Stevens Anchorage International Airport.

Some of you may have already begun coordination with the project team. The project recently entered into the National Environmental Policy Act (NEPA) process under the Federal Aviation Administration and this request for comment is a part of the NEPA regulatory process.

Please don’t hesitate to reach out with any questions or comments.

Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

(907) 562-2000 | office
(907) 865-1238 | direct

*dowl.com*

## Theresa Dutchuk

| | |
|---|---|
| **From:** | Palmer, Charley (DEC) <charley.palmer@alaska.gov> |
| **Sent:** | Thursday, June 16, 2022 11:50 AM |
| **To:** | Theresa Dutchuk |
| **Cc:** | DEC Agency Reviews; Murray, Heather M (DEC); Robertson, Roy A (DEC); Christian, Cindy L (DEC) |
| **Subject:** | [EXT] FW: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport |
| **Attachments:** | ACCS Agency Scoping Letter_.pdf; DEC_PWS_Map.JPG |



Hi Theresa,

For future reference, please send these requests for review to our dec.agencyreviews@alaska.gov email distribution list. This will make sure that the Drinking Water Program will review and respond. For those that are not near a regulated public water system, we will assume that no response is equivalent to no objection. We define "near" a public water system as within the Drinking Water Protection Area for an active public water system source.

Thank you for the opportunity to comment with respect to public water system (PWS) sources. Given the location(s) provided, this project is not near an active registered PWS source (see attached "DEC_PWS_Map.JPG").

Regards,
--
Charley Palmer, *Hydrologist 3*
**Alaska DEC**
Division of Environmental Health
Drinking Water Program
**Drinking Water Source Protection**

---

**From:** Christian, Cindy L (DEC) <cindy.christian@alaska.gov>
**Sent:** Friday, June 10, 2022 1:19 PM
**To:** Miller, Christopher C (DEC) <chris.miller@alaska.gov>; Palmer, Charley (DEC) <charley.palmer@alaska.gov>
**Subject:** FW: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

FYI, here is an agency scoping letter that we should have a look at. Thanks!

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, June 10, 2022 1:00 PM
**To:** Moller, Sandra (CED) <sandra.moller@alaska.gov>; Christian, Cindy L (DEC) <cindy.christian@alaska.gov>; DEC-Webmaster (DEC sponsored) <DEC.Webmaster@alaska.gov>; Larson, Tiffany M (DEC) <tiffany.larson@alaska.gov>; Rypkema, James (DEC) <james.rypkema@alaska.gov>; Colvin, Rebecca A (DEC) <rebecca.colvin@alaska.gov>; Chambon, Katrina M (DEC) <katrina.chambon@alaska.gov>; Kito, Sam (DEC) <sam.kito@alaska.gov>; Wardlow, Cynthia M (DFG) <cynthia.wardlow@alaska.gov>; DNR, DNR Parks Chugach State Park (DNR sponsored) <csp@alaska.gov>; DNR, Parks

OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>; Bittner, Judith E (DNR) <judy.bittner@alaska.gov>; sturges.susan@epa.gov; ak_fisheries@fws.gov; tom.davis@anchorageak.gov; WeedCJ@muni.org; ellissm@muni.org; bunnellKR@muni.org; patricia.maxwell@anchorageak.gov; matthew.stichick@anchorageak.gov; jbrune@ciri.com; kfoster@eklutnainc.com; faithr@eklutna.org; Pagemaster, Reg POA <regpagemaster@usace.army.mil>
**Cc:** Lindseth, Teri D (DOT) <teri.lindseth@alaska.gov>; Matt VanGoethem <mvangoethem@exploredesign.com>; Jason Gamache <jgamache@exploredesign.com>; Joe Jacobson <jjacobson@mckinley-alaska.com>; Gilbertsen, Jack (FAA) <jack.gilbertsen@faa.gov>
**Subject:** Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

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Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

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THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

SPILL PREVENTION & RESPONSE
Contaminated Sites Program

610 University Avenue
Fairbanks, Alaska 99709
Main: 907.451.2143
Fax: 907.451.2155
www.dec.alaska.gov

September 21, 2022

Theresa Dutchuk
DOWL
4041 B Street
Anchorage, AK 99503

**RE: Alaska Cargo and Cold Storage Project, Preliminary Environmental Research**

Dear Ms. Dutchuk

The Alaska Department of Environmental Conservation (DEC), Division of Spill Prevention and Response (SPAR), Contaminated Sites Program has reviewed the Preliminary Environmental Research document for the Alaska Cargo and Cold Storage Facility proposed for construction at Ted Stevens Anchorage International Airport.

As noted in the document, the Phase I Environmental Assessment indicates the site is likely contaminated with perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), as well as petroleum compounds. Since the Phase I assessment was completed, sampling at the site has confirmed the presence of these contaminants in both soil and water at concentrations that do not allow for unrestricted use or disposal.

The document also notes that coordination with DEC is ongoing, and we would like to express our appreciation for the coordination with the project team that has occurred to date. We look forward to working with you as the project progresses to ensure the development occurs in a manner that is protective of human health and the environment. Specific comments are provided below:

1) Conversations with the project team indicate that peaty soils contaminated with PFOS and PFOA will largely be left in place. If excess soils are generated that require treatment or disposal, please coordinate with DEC on transport approval.

2) The project team also indicates that significant de-watering of contaminated water will be necessary to support construction of the facility. We've discussed treatment of wastewater with the project team and it is DEC's understanding that a plan will be submitted prior to dewatering of the site (active or passive). Please feel free to contact DEC if you would like to discuss dewatering activities in greater detail, otherwise we look forward to reviewing the plan for water treatment prior to disposal.

Sincerely,

William A O'Connell

Bill O'Connell
Environmental Program Manager

## Theresa Dutchuk

**From:** DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>
**Sent:** Tuesday, June 14, 2022 3:09 PM
**To:** Theresa Dutchuk
**Cc:** Ortiz, Liz M (DNR)
**Subject:** [EXT] FW: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport
**Attachments:** ACCS Agency Scoping Letter_.pdf

***WARNING:*** *External Sender - use caution when clicking links and opening attachments.*

Hi Theresa,

The Office of History and Archaeology/Alaska State Historic Preservation Office received your documentation, and its review has been logged in with Liz Ortiz under 2022-00674. Our office has 30 calendar days after receipt to complete our review and may contact you if we require additional information. Please contact the project reviewer or me by email if you have any questions or concerns.

Best,
Sarah

***Sarah Meitl***
Review and Compliance Coordinator
Alaska State Historic Preservation Office
Office of History and Archaeology 907-
269-8720
sarah.meitl@alaska.gov

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, June 10, 2022 1:00 PM
**To:** Moller, Sandra (CED) <sandra.moller@alaska.gov>; Christian, Cindy L (DEC) <cindy.christian@alaska.gov>; DEC-Webmaster (DEC sponsored) <DEC.Webmaster@alaska.gov>; Larson, Tiffany M (DEC) <tiffany.larson@alaska.gov>; Rypkema, James (DEC) <james.rypkema@alaska.gov>; Colvin, Rebecca A (DEC) <rebecca.colvin@alaska.gov>; Chambon, Katrina M (DEC) <katrina.chambon@alaska.gov>; Kito, Sam (DEC) <sam.kito@alaska.gov>; Wardlow, Cynthia M (DFG) <cynthia.wardlow@alaska.gov>; DNR, DNR Parks Chugach State Park (DNR sponsored) <csp@alaska.gov>; DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>; Bittner, Judith E (DNR) <judy.bittner@alaska.gov>; sturges.susan@epa.gov; ak_fisheries@fws.gov; tom.davis@anchorageak.gov; WeedCJ@muni.org; ellissm@muni.org; bunnellKR@muni.org; patricia.maxwell@anchorageak.gov; matthew.stichick@anchorageak.gov; jbrune@ciri.com; kfoster@eklutnainc.com; faithr@eklutna.org; Pagemaster, Reg POA <regpagemaster@usace.army.mil>
**Cc:** Lindseth, Teri D (DOT) <teri.lindseth@alaska.gov>; Matt VanGoethem <mvangoethem@exploredesign.com>; Jason Gamache <jgamache@exploredesign.com>; Joe Jacobson <jjacobson@mckinley-alaska.com>; Gilbertsen, Jack (FAA) <jack.gilbertsen@faa.gov>
**Subject:** Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

> **CAUTION:** This email originated from outside the State of Alaska mail system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Agency Contacts,

Please find attached scoping materials and request for comments regarding the Alaska Cargo and Cold Storage project at Ted Stevens Anchorage International Airport.

Some of you may have already begun coordination with the project team. The project recently entered into the National Environmental Policy Act (NEPA) process under the Federal Aviation Administration and this request for comment is a part of the NEPA regulatory process.

Please don't hesitate to reach out with any questions or comments.

Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

(907) 562-2000 | office
(907) 865-1238 | direct

***dowl.com***

## Theresa Dutchuk

| | |
|---|---|
| **From:** | Ortiz, Liz M (DNR) <liz.ortiz@alaska.gov> |
| **Sent:** | Thursday, June 30, 2022 12:47 PM |
| **To:** | Theresa Dutchuk |
| **Cc:** | Ortiz, Liz M (DNR) |
| **Subject:** | [EXT] RE: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport |

***WARNING:*** *External Sender - use caution when clicking links and opening attachments.*

3130-1R FAA 2022-00674

Good afternoon Theresa,

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated June 10, 2022) concerning the subject project on June 14, 2022. Following our review of the documentation provided, our office offers the following comments.

1. There are no identified historic properties in the immediate project vicinity. However, identification and evaluation of impacts may be needed for cultural resources in the project area.
2. Cultural investigations on State-managed lands may require a survey permit from our office.
3. Our office does not have any anticipated concerns at this early stage of design.

This email serves as our office's official correspondence for the NEPA comment period. Thank you for the opportunity to review this project scoping request. Please contact Liz Ortiz at 269-8722 or liz.ortiz@alaska.gov if you have any questions or we can be of further assistance.

Thanks,
-Liz

Liz Ortiz, M.A. Archaeologist II
Review and Compliance
Alaska State Historic Preservation Office
Office of History and Archaeology
Department of Natural Resources
550 W. 7th Ave, Suite 1310, Anchorage AK, 99501
(907) 269-8722 liz.ortiz@alaska.gov
Due to Covid-19 concerns, we are on a hybrid schedule. Email is the best communication method.

---

**From:** DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>
**Sent:** Tuesday, June 14, 2022 3:09 PM
**To:** Dutchuk, Theresa (DOT sponsored) <tdutchuk@dowl.com>
**Cc:** Ortiz, Liz M (DNR) <liz.ortiz@alaska.gov>
**Subject:** FW: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

Hi Theresa,

The Office of History and Archaeology/Alaska State Historic Preservation Office received your documentation, and its review has been logged in with Liz Ortiz under 2022-00674. Our office has 30 calendar days after receipt to complete our review and may contact you if we require additional information. Please contact the project reviewer or me by email if you have any questions or concerns.

Best,
Sarah

***Sarah Meitl***
Review and Compliance Coordinator
Alaska State Historic Preservation Office
Office of History and Archaeology 907-
269-8720
sarah.meitl@alaska.gov

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, June 10, 2022 1:00 PM
**To:** Moller, Sandra (CED) <sandra.moller@alaska.gov>; Christian, Cindy L (DEC) <cindy.christian@alaska.gov>; DEC-Webmaster (DEC sponsored) <DEC.Webmaster@alaska.gov>; Larson, Tiffany M (DEC) <tiffany.larson@alaska.gov>; Rypkema, James (DEC) <james.rypkema@alaska.gov>; Colvin, Rebecca A (DEC) <rebecca.colvin@alaska.gov>; Chambon, Katrina M (DEC) <katrina.chambon@alaska.gov>; Kito, Sam (DEC) <sam.kito@alaska.gov>; Wardlow, Cynthia M (DFG) <cynthia.wardlow@alaska.gov>; DNR, DNR Parks Chugach State Park (DNR sponsored) <csp@alaska.gov>; DNR, Parks OHA Review Compliance (DNR sponsored) <oha.revcomp@alaska.gov>; Bittner, Judith E (DNR) <judy.bittner@alaska.gov>; sturges.susan@epa.gov; ak_fisheries@fws.gov; tom.davis@anchorageak.gov; WeedCJ@muni.org; ellissm@muni.org; bunnellKR@muni.org; patricia.maxwell@anchorageak.gov; matthew.stichick@anchorageak.gov; jbrune@ciri.com; kfoster@eklutnainc.com; faithr@eklutna.org; Pagemaster, Reg POA <regpagemaster@usace.army.mil>
**Cc:** Lindseth, Teri D (DOT) <teri.lindseth@alaska.gov>; Matt VanGoethem <mvangoethem@exploredesign.com>; Jason Gamache <jgamache@exploredesign.com>; Joe Jacobson <jjacobson@mckinley-alaska.com>; Gilbertsen, Jack (FAA) <jack.gilbertsen@faa.gov>
**Subject:** Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport



Hello Agency Contacts,

Please find attached scoping materials and request for comments regarding the Alaska Cargo and Cold Storage project at Ted Stevens Anchorage International Airport.

Some of you may have already begun coordination with the project team. The project recently entered into the National Environmental Policy Act (NEPA) process under the Federal Aviation Administration and this request for comment is a part of the NEPA regulatory process.

Please don't hesitate to reach out with any questions or comments.

Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1238 | direct

## Theresa Dutchuk

**From:** Bunnell, Kristine R. <kristine.bunnell@anchorageak.gov>
**Sent:** Monday, June 13, 2022 3:11 PM
**To:** Theresa Dutchuk
**Subject:** RE: [EXT] RE: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

You don't often get email from kristine.bunnell@anchorageak.gov. Learn why this is important

That's it for now. I will advise staff to the Watershed Commission in case they have other questions.
Thanks so much!

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Monday, June 13, 2022 3:06 PM
**To:** Bunnell, Kristine R. <kristine.bunnell@anchorageak.gov>
**Subject:** RE: [EXT] RE: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

**[EXTERNAL EMAIL]**

Hi Kristine,

Thanks for the question, we are answering the same question for the USACE right now and working on narrative and figures. I will be sure to send it all your way when the team has all the details dialed.

For now I can offer this explanation: The team has been working with DEC and the approved proposal is to surcharge the land from north to south, subsequently pushing the contaminated water up a against a berm at the southern end where we will have pumps in place to collect the water runoff. From there the water will be pumped through a granular activated carbon (GAC) filter to clean it, and then the clean water will disposed of either in the storm drain or in an adjacent land location.

More details to come and I will keep you in the loop! Please let me know if you have additional questions!

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

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(907) 562-2000 | office
(907) 865-1238 | direct
*dowl.com*

---

**From:** Bunnell, Kristine R. <kristine.bunnell@anchorageak.gov>
**Sent:** Monday, June 13, 2022 2:50 PM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** [EXT] RE: Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

You don't often get email from kristine.bunnell@anchorageak.gov. Learn why this is important

**WARNING:** *External Sender - use caution when clicking links and opening attachments.*

Dear Theresa,

Could you please explain in more detail what the below language highlighted red means? How is the contaminated runoff going to be processed, decontaminated, or? What elements of coordination with ADEC will be established? Will the Municipality be made aware of any coordination and management of the runoff?

**"A search of the ADEC drinking water mapping application indicates there are no drinking water protections areas within one mile of the project. A search of Environmental Protection Agency's sole source aquifers indicates there are no such resources in Alaska. The project proposed to surcharge land saturated with PFOS and/or PFOA contaminated waters."** Proper management of contaminated water runoff resulting from the land surcharging will be coordinated with ADEC.

Thank you, Kristine Bunnell

Planning Department
MUNICIPALITY OF ANCHORAGE


Kristine René Bunnell
Manager • Planning Department
Long-Range Planning Division
Email: kristine.bunnell@anchorageak.gov
Phone: (907) 343-7920
4700 Elmore Road, Anchorage, AK 99507
www.muni.org/planning


---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, June 10, 2022 1:00 PM
**To:** sandra.moller@alaska.gov; cindy.christian@alaska.gov; dec.webmaster@alaska.gov; tiffany.larson@alaska.gov; jim.rypkema@alaska.gov; rebecca.colvin@alaska.gov; katrina.chambon@alaska.gov; sam.kito@alaska.gov; cynthia.wardlow@alaska.gov; csp@alaska.gov; oha.revcomp@alaska.gov; judith.bittner@alaska.gov; sturges.susan@epa.gov; ak_fisheries@fws.gov; Davis, Tom G. <tom.davis@anchorageak.gov>; Weed, Charles J. <charles.weed@anchorageak.gov>; Ellis, Steve M. <steven.ellis@anchorageak.gov>; Bunnell, Kristine R. <kristine.bunnell@anchorageak.gov>; Maxwell, Patricia L. <patricia.maxwell@anchorageak.gov>; Stichick, Matthew M. <matthew.stichick@anchorageak.gov>; jbrune@ciri.com; kfoster@eklutnainc.com; faithr@eklutna.org; Pagemaster, Reg POA <regpagemaster@usace.army.mil>
**Cc:** Teri Lindseth <teri.lindseth@alaska.gov>; Matt VanGoethem <mvangoethem@exploredesign.com>; Jason Gamache <jgamache@exploredesign.com>; Joe Jacobson <jjacobson@mckinley-alaska.com>; Gilbertsen, Jack (FAA) <jack.gilbertsen@faa.gov>
**Subject:** Request for Agency Comment - Alaska Cargo and Cold Storage Project, Ted Stevens Anchorage International Airport

**[EXTERNAL EMAIL]**

Hello Agency Contacts,

Please find attached scoping materials and request for comments regarding the Alaska Cargo and Cold Storage project at Ted Stevens Anchorage International Airport.

Some of you may have already begun coordination with the project team. The project recently entered into the National Environmental Policy Act (NEPA) process under the Federal Aviation Administration and this request for comment is a part of the NEPA regulatory process.

Please don’t hesitate to reach out with any questions or comments.

Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

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## Theresa Dutchuk

| | |
|---|---|
| **From:** | Boldrick, Lauren <Boldrick.Lauren@epa.gov> |
| **Sent:** | Monday, July 18, 2022 6:52 AM |
| **To:** | jack.gilbertsen@faa.gov; Theresa Dutchuk |
| **Subject:** | [EXT] Alaska Cargo and Cold Storage Project - EPA R10 Comments |



Good Morning Jack and Theresa,

The U.S. Environmental Protection Agency has reviewed the June 2022 Notice of Intent to develop an Environmental Assessment for the Alaska Cargo and Cold Storage's proposal to construct cargo infrastructure at Ted Stevens Anchorage International Airport (ANC) in Anchorage, Alaska. EPA has conducted its review pursuant to the National Environmental Policy Act and our review authority under Section 309 of the Clean Air Act. The CAA Section 309 role is unique to EPA and requires EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement.

The Notice of Intent identifies potential environmental considerations within or in near proximity of the project area, such as Class A high value wetlands, land saturated with PFOS and/or PFOA contaminated waters, twelve Alaska Department of Environmental Conservation (ADEC) Contaminated Sites.

EPA recommends the EA consider ongoing and projected regional and local climate change impacts and ensure robust climate resilience/adaption planning in the project design. EPA recommends implementing efficiency in material design, by using sustainable building materials and sustainable building practices, e.g., when practicable, reducing steel and cement use during construction. EPA also recommends evaluating the use of low-carbon cement to reduce greenhouse gas emissions compared to traditional cements.

It may be useful for the FAA to consider how the proposed building and local site characteristics affect the magnitude of the embodied GHG emissions[1] or their contribution to life cycle GHG emissions. Examples of the parameters commonly analyzed are the type of building and its use; site-specific properties (e.g., state, climatic zone, seismic zone); relevant energy performance standards; construction methods; building design characteristics (building materials for structural system, envelope, internal walls); and the size and shape of the building (e.g., floor area, number of stories, general shape).
Regarding the operational GHG emissions analysis, EPA recommends FAA analyze the energy used for heating and/or cooling, hot water supply, ventilation and air conditioning, lighting, and process-related climate-relevant GHG emissions, i.e., the release of refrigerants and blowing agents (HFC- and PFC-gases). The IPCC recognized that because buildings are responsible for a massive amount of current GHG emissions, they also have significant potential to reduce GHG emissions through improved operational energy efficiency[2].

EPA notes that the NOI discusses the potential impact to three wetland areas, indicating that Class A high value wetlands are within the boundaries of the project. Adverse impacts to wetlands should be avoided, minimized, and mitigated, respectively. The EA should evaluate the important functions and values associated with these wetlands, noting the local and regional importance. EPA encourages evaluation these habitats using the Alaska Debit-Credit Methodology to assess the proposed impacts to wetlands and calculate the In-Lieu Fee credits that must be purchased to compensate accordingly.

Sources:
1._Röck et al. Embodied GHG emissions of buildings – The hidden challenge for effective climate change mitigation. Applied Energy, Volume 258. 2020. https://doi.org/10.1016/j.apenergy.2019.114107.

2. H. de Coninck, A. Revi, M. Babiker, P. Bertoldi, M. Buckeridge, A. Cartwright, et al. Strengthening and Implementing the Global Response. Global Warming of 1.5°C, IPCC Special Report (2018).

If you have any questions or comments about our review, please let me know.
Thank you.

---------

Lauren Boldrick, CPG
NEPA Reviewer
Policy and Environmental Review Branch
EPA Region 10

*Submit NEPA environmental review documents to R10-NEPA@epa.gov*

## Theresa Dutchuk

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Friday, June 2, 2023 1:38 PM
**To:** Theresa Dutchuk
**Cc:** Joe Jacobson; Jason Gamache; Matt VanGoethem; Burgess, Robert A (DEC); Jon Ma
**Subject:** RE: [EXT] RE: Alaska Cargo and Cold Storage, ADEC Hazard ID 27137

Thanks Theresa, the draft plan is looking good and aligns with DEC's requirements for management of soil and water containing PFOS or PFOA above the cleanup level.

We should discuss the trench dewatering described in Section 3.2 as dewatering a trench into an area that has been amended with GAC might render the GAC less effective at removing the PFAS in water displaced through surcharging, depending on the volume of water that is pumped out. I believe we can work that out between now and when this is finalized, so please us know if you'd like to meet to discuss it before you submit the draft final.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Thursday, June 1, 2023 1:42 PM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Cc:** Joe Jacobson <jjacobson@mckinley-alaska.com>; Jason Gamache <jgamache@exploredesign.com>; Matt VanGoethem <mvangoethem@exploredesign.com>; Burgess, Robert A (DEC) <robert.burgess@alaska.gov>; Jon Ma <jma@westlark.com>
**Subject:** RE: [EXT] RE: Alaska Cargo and Cold Storage, ADEC Hazard ID 27137

Hi Bill,

We have drafted a Contaminated Materials Management Plan for your review (attached). We are looking forward to working with you and your office to finalize a plan over the next couple of months and appreciate any preliminary feedback you may have.

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1238 | direct
*dowl.com*

---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Wednesday, April 26, 2023 11:37 AM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Cc:** Joe Jacobson <jjacobson@mckinley-alaska.com>; Jason Gamache <jgamache@exploredesign.com>; Matt VanGoethem <mvangoethem@exploredesign.com>; Burgess, Robert A (DEC) <robert.burgess@alaska.gov>
**Subject:** [EXT] RE: Alaska Cargo and Cold Storage, ADEC Hazard ID 27137

*WARNING:* *External Sender - use caution when clicking links and opening attachments.*

Hi Theresa, yes this approach seems appropriate but it will be more helpful to see a plan with drawings and more detailed description of the development process. The information you provided discuses the general treatment of water that may be passively discharged through the surcharge process, but I will also be looking for information on the treatment of any water that is actively pumped (like for utility installation) and water that will be directed towards surface water drainage channels that may not be subject to the passive treatment.

Let me know if you'd like to have any other preliminary discussions before you submit the plan.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Tuesday, April 25, 2023 3:45 PM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Cc:** Joe Jacobson <jjacobson@mckinley-alaska.com>; Jason Gamache <jgamache@exploredesign.com>; Matt VanGoethem <mvangoethem@exploredesign.com>
**Subject:** Alaska Cargo and Cold Storage, ADEC Hazard ID 27137



Hi Bill,

Update for you on Alaska Cargo and Cold Storage PFAS mitigation planning as it relates to ADEC Hazard ID 27137, AIA Aircraft Rescue and Fire Fighting Building PFAS. Attached is the current proposed approach for mitigating PFAS contaminated groundwater. In addition, it is still expected that while PFAS contaminated materials may be moved around the site, all will remain on-site. Subsequently decontamination of equipment, such to not spread PFAS off-site, would incorporate methods similar to the following:

All equipment encountering soils on-site will be decontaminated prior to leaving the site. Soil and materials will be brushed off equipment with a designated bristled brush. Once all soil and material is removed, a wet decontamination with Alconox® solution or sodium triphosphate would be performed, and rinsed twice with potable water, then de-ionized water and air dried.

We look forward to coordinating with you to finalize a plan. We understand ADEC approval is necessary prior to construction.

We would be pleased to hear your thoughts as to whether or not these methods are appropriate before we move on to finalizing a plan.

Thank you!
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

(907) 562-2000 | office
(907) 865-1238 | direct

## Theresa Dutchuk

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Wednesday, December 20, 2023 2:42 PM
**To:** Theresa Dutchuk
**Cc:** Kito, Sam (DEC)
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Theresa, thank you for addressing my comments. Everything looks good in the plan so far and I don't have any further comments. I'm looking forward to approving the final plan and can work with Sam on the excavation dewatering permit application as needed once that is submitted.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Monday, November 27, 2023 12:25 PM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Cc:** Kito, Sam (DEC) <sam.kito@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

Thank you very much for your review of the ACCS plan. Please see attached for a revised Plan per your comments below. I spoke with the proposed remediation consultant and confirmed adding treatment along the lease lot to cover the entire boundary between ACCS and FedEx was achievable. The Plan has been updated accordingly.

Please let us know if you would like to see anything else!

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

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*dowl.com*

---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Wednesday, November 22, 2023 9:19 AM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Cc:** Kito, Sam (DEC) <sam.kito@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Thanks Theresa, I have two comments on the revised plan

1. Section 3.2, first paragraph- Breakthrough calculations are typically performed prior to any water filtration and are used to size the carbon treatment system bases on the contaminant concentrations and volume of water to

be treated. The text in this paragraph has those calculations occurring after the treatment system is designed and onsite, which could cause delays or cost overruns if it was not designed accordingly.

2. Figure 3- The stormwater outlet for the bog is in the NE corner of the FedEx lease and is the area where surface water displaced during the surcharging is likely to migrate. As we discussed there is no treatment proposed for the NE boundary of the ACCS project, potentially allowing PFAS contaminated water to migrate onto the FedEx lease and towards the outlet. To address this concern, please extend the edge sorptive amendment, shown in pink on the figure, along this NE project boundary as well.

Feel free to give me a call if you'd like to discuss my comments.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, November 10, 2023 11:53 AM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

See attached for an updated document with a new Figure 3: Site Map.

Hope you're staying safe in this snow!

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1238 | direct
*dowl.com*

---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Tuesday, October 31, 2023 1:11 PM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Thanks Theresa, at this stage in the process I think I'll need that to approve this next iteration of the CMMP.

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

---

**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Tuesday, October 31, 2023 1:05 PM

**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

Sorry for the delayed response. We don't have any figures yet, but certainly I could have our GIS folks put one together to supplement the Plan.

Let me know what you think,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

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(907) 562-2000 | office
(907) 865-1238 | direct
*dowl.com*

---

**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Monday, October 23, 2023 10:41 AM
**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Thanks Theresa, are there any figures yet showing the alignment of the remediation trench?

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

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**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Wednesday, October 18, 2023 12:38 PM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** RE: [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

Hi Bill,

An updated Interim CMMP is attached for your review. We updated the last draft per your comments below.

Please let us know if there are any further questions or comments. A Final CMMP will be prepared as a supplement to the General Excavation Dewatering Permit application.

Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**
(907) 562-2000 | office
(907) 865-1238 | direct
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**From:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Sent:** Monday, October 9, 2023 3:30 PM

**To:** Theresa Dutchuk <tdutchuk@dowl.com>
**Subject:** [EXT] RE: ACCS NEPA Interim Contaminated Materials Management Plan

***WARNING:*** *External Sender - use caution when clicking links and opening attachments.*

Hi Theresa, here are my comments on the interim CMMP. Let me know if you want to discuss my comment on water treatment

1. Paragraph below Figure 1- This section should include groundwater, as well as soil and surface water. Completed
2. Paragraph below figure 2- ppt in this context is parts per trillion, or nanograms per liter (ng/l) if you want to stick with metric units. For the purposes of excavation dewatering, we have been applying the 2016 EPA lifetime health advisory level of 70 ppt to design water treatment systems. Completed
3. Section 3.2 describes a process where PFAS contaminated water will be pumped from an excavation and discharged to the remediation trench described in Section 3.1. The goal of the remediation trench is to reduce or eliminate PFAS in water that migrates through the trench during the surcharging process, so if the adsorptive capacity of the carbon in the trench is expended treating water that is discharged directly to the trench, then it loses it's effectiveness at treating water that is passively discharged during surcharging. Additionally, calculating breakthrough for a mix of activated carbon and gravel may be problematic. Please note that petroleum is also present in water at the site in several locations which will also affect the PFAS adsorptive capacity of the carbon. At similar projects, contractors have typically proposed dedicated carbon treatment vessels where the residence time and adsorptive capacity can be better controlled and there can be greater confidence in the breakthrough calculations. If designed based on the breakthrough calculations, then the water can be directly discharged to stormwater following treatment. Please note that active pumping and treatment of contaminated groundwater may also be necessary during installation of the remediation trench itself. Clarified that the active water will be discharged into carbon filter vessels, leaving the trench for the surcharged passive water

Bill

**Bill O'Connell**
*Site Cleanup Manager*
*ADEC Contaminated Sites Program*
*(907) 269-3057*

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**From:** Theresa Dutchuk <tdutchuk@dowl.com>
**Sent:** Friday, October 6, 2023 9:48 AM
**To:** O'Connell, Bill A (DEC) <bill.oconnell@alaska.gov>
**Subject:** ACCS NEPA Interim Contaminated Materials Management Plan



Good Morning Bill –

Attached for your review is a NEPA Interim Contaminated Materials Management Plan to support the NEPA documentation. A final version will be prepared to support the excavation dewatering permit which will be required for the project. This Plan contains preliminary proposed methods to address PFAS contamination at Postmark Bog during construction.

Please let us know if you approve of this NEPA Interim Contaminated Materials Management Plan or if you have any comments.

Thank you!
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

**DOWL**

(907) 562-2000 | office
(907) 865-1238 | direct

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## Theresa Dutchuk

| | |
|---|---|
| **From:** | Theresa Dutchuk |
| **Sent:** | Tuesday, September 12, 2023 9:08 AM |
| **To:** | Bunnell, Kristine R.; O'Connell, Bill A (DEC); rebecca.colvin@alaska.gov; charley.palmer@alaska.gov; boldrick.lauren@epa.gov; Meitl, Sarah J (DNR); Ortiz, Liz M (DNR) |
| **Cc:** | Johansen, John E (DOT) |
| **Subject:** | Alaska Cargo and Cold Storage - Draft Environmental Assessment Notice of Availability and Public Meeting |
| **Attachments:** | ACCS EA NOA.pdf |

Hello Agency Personnel,

We are reaching out to you with a Notice of Availability and Notice of Public Meeting for the Alaska Cargo and Cold Storage Draft Environmental Assessment (attached). You are receiving this email because you or your agency provided response to Scoping Letters sent June 10, 2022.

Please find information on where to find the Draft Environmental Assessment, ways to comment, and details of the public meeting in the attached Notice.

Thank you,
Theresa

**Theresa Dutchuk**
Senior NEPA Specialist

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CARGO & COLD STORAGE
ALASKA

**DRAFT ENVIRONMENTAL ASSESSMENT AVAILABLE FOR PUBLIC COMMENT**

**NOTICE OF PUBLIC MEETING**

**Project Title: Alaska Cargo & Cold Storage Facility**

Alaska Cargo and Cold Storage, LLC, in cooperation with Ted Stevens Anchorage International Airport (ANC) and the Federal Aviation Administration (FAA) is soliciting comments on a Draft Environmental Assessment (EA) for proposal to construct cargo infrastructure at ANC in Anchorage, Alaska.

The proposed project will be incorporated into the ANC Airport Layout Plan and requires approval from the FAA and therefore is subject to the National Environmental Policy Act (NEPA). An environmental assessment has been prepared for the project to consider environmental impacts. The purpose of the proposed project is to develop infrastructure to support air cargo operations at ANC.

The proposed work requiring federal approval would include a new Aircraft Parking Apron, Cargo Warehouse, Cold Storage, Hardstand Fuel Distribution, Ground Support Equipment Shop and Parking, Ancillary/Control Space and Road Connection to Postmark Drive. Construction for the proposed project is anticipated to begin in fall 2023.

The purpose of the proposed project is to construct an energy-efficient, climate-controlled air cargo warehouse facility and hardstand parking for cargo jets at ANC. The purpose of the cargo facilities is to help improve cargo deplaning and enplaning efficiency, provide parking locations for cargo jets where they can power down, and build Alaska's economy.

To ensure that all possible factors are considered, please provide comments to the following locations by **October 15, 2023.** Written comments may be sent to Theresa Dutchuk at tdutchuk@dowl.com or comments by phone may be directed to (907) 865-1238**.**

The Draft EA and appendices are available for review at: https://dot.alaska.gov/anc/

Per the NEPA process, a public meeting will be held on **October 3, 2023** from 4:00 to 6:00pm at the Spenard Community Recreational Center, Multi-Purpose room, 2020 W. 48th Avenue, Anchorage, AK 99517.

If you have any questions or require additional information, please contact Theresa Dutchuk, Environmental Specialist, (907) 865-1238 for information on project environmental impacts. Before including your address, phone number, e-mail address or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.