STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHCOAST REGION

Interim Work Authorization

Project No.: AIP 3-02-0111-006-2020 / Z675170000 IWA No. 4

Project Name: GST Airport Apron, Runway, and Taxiway Pavement Rehab

Contractor: Secon
Address: P.O. Box 32159
Juneau, AK 99803

Estimated amount of IWA: $50,000

Recommended By: Brian Hanson Digitally signed by Brian Hanson Date: 2021.04.03 17:45:00 -08'00' Date: 4/3/21
Project Engineer

Approved By: Garrett Paul Date: 4/3/21
Department *(can be verbal)*

Acknowledged By: _____ Date: _____
Contractor's Representative

Permission for previously submitted subcontractor(s) to perform all or portions of the work described herein is as checked: ☒Yes ☐ No ☐ N/A.

The following change(s) in the above Contract are hereby made in accordance with the terms of the Contract and under the terms and conditions stated below. Price adjustments resulting from inaccurate cost and pricing data are subject to the provisions of AS 36.30.400(c). This document shall become an interim amendment to the Contract and all provisions of the Contract will be applicable. Items not mentioned shall not be affected by this document. This document shall be superseded by a subsequent Change Order, which will address any adjustments to contract time.

Basis of Payment (Check One)

☒ Payment for the following work will be paid per Section 90-05 of the Standard Specifications.

☐ Payment for the following work will be paid per the unit prices and method of measurement stated.

☐ Payment for the following work will be paid as a lump sum item.

DESCRIPTION OF CHANGE (Use Continuation Sheet 25D-065 as Required)

The Basis of Payment for the Work in this IWA has not yet been agreed upon thru the RFP process. This IWA authorizes Time and Materials compensation for the Contractor to procure, ship, and mobilize the following materials that are required by the attached Soil Management Plan and Specification P-171 PFAS Soil Management Plan.

- Brushes to remove visible soil from equipment
- Disposable boot covers
- Safety glasses
- Disposable Nitrile gloves.
- Rope for tying down sand bags and securing the top liner.
- 6"-diameter Straw wattles.
- 60 pound sand bags.

- Public health and safety signs.
- 11 mil polyethylene top liner sized for (2) 75' x 75' containment cells.
- 20 mil PVC bottom liner. Liner shall meet Table D on page 4 of the Soil Management Plan. The liner shall be sized for (2) 75' x 75' containment cells.

The detail and photo in Attachment 2 of the Soil Management Plan were provided as examples only. They do not dictate any construction requirements for this project.

Unused materials shall be turned over to the DOT upon project completion.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

555 Cordova Street
Anchorage, AK 99501
Main: 907.269.7557
Fax: 907.269.7648

File No.:1507.38.017

March 10th, 2021

electronic transmittal only
Jessica Eller
Alaska Department of Transportation and Public Facilities
jessica.eller@alaska.gov

Re: **ADOT &PF Gustavus Airport Site Wide PFAS-Soil Management Plan**

Dear Ms. Eller,

The Alaska Department of Environmental Conservation (ADEC) contaminated sites program received the revised *Soil Management Plan for the Gustavus Airport Apron, Runway, and Taxiway Pavement Rehabilitation Project* on March 9th, 2021. **ADEC has reviewed the soil management plan (SMP) and is in support of the plan with no additional comments.**

Please be aware that stockpiling the contaminated soil is not a long term solution. ADOT should pursue funding and options for remediation or disposal of this soil. If you have any questions or need further assistance, please feel free to contact me via email at erin.gleason@alaska.gov.

Sincerely,

Erin Gleason

Erin Gleason
Environmental Program Specialist

Electronic cc:
Marcus Zimmerman, ADOT, marcus.zimmerman@alaska.gov
Sammy Cummings, ADOT, sammy.cummings@alaska.gov
Ben Storey, ADOT, Benjamin.storey@alaska.gov

Soil Management Plan

ADEC File No. 1507.38.017

Gustavus Airport Apron, Runway, and Taxiway
Pavement Rehabilitation Project

State Project No. Z675170000

March 9, 2021

Prepared by
DOT&PF
Southcoast Region

The environmental review, consultation, and other actions required by Federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

Purpose

This Soil Management Plan (SMP) provides direction for managing disturbed contaminated materials during the Alaska Department of Transportation and Public Facilities' (DOT&PF) Gustavus Airport Apron, Runway, and Taxiway Pavement Rehabilitation project (State Project No. Z675170000) at the Gustavus Airport (GST) in Gustavus, Alaska. The planned work includes:

- resurface and rehabilitate existing taxiways, aprons, and runways;
- add new taxiways F and G;
- install new lighting as needed for taxiway F;
- expand, grade, and pave the General Aviation Apron, new taxiway F, and new taxiway G, including:
  - place 0-6' of fill in expanded General Aviation Apron area,
  - remove and replace existing hardstands and tie-downs; and
- groove and stripe where necessary.

Scope

This SMP includes procedures for contaminated material stockpiling location and requirements, controlling pollutants at excavation sites, decontamination, and reporting requirements. The procedures contained herein do not preclude additional site- or project-specific requirements required to protect the health and safety of workers. The Contractor is responsible for performing due diligence to ensure the safety of their employees. See Appendix 1 Section 7.0 for DOT&PF requirements for health and safety.

Procedures

In total, there will be 2,000 cubic yard (c.y.) of potentially PFAS-contaminated material produced during project work. (See the table in Appendix 1 Section 4.0 and Figure 6 for a breakdown of all [PFAS and non-PFAS] material produced.) Of that 2,000 c.y., 110 c.y.—produced during excavation of the new culvert reorientation—will be returned to the area where it came from and capped (paved over). The remaining 1,890 c.y.—90 c.y. produced from excavation of Taxiway 'F' and 1,800 produced during clearing and grubbing in the new G.A. Expansion Area and Taxiway 'F'—will be stockpiled. See Attachment 1 for a map of locations.

Excavation Procedures

1. Excavation activities shall be performed in a manner that minimizes worker exposure and protects the environment from site contaminants.
2. A designated work area shall be established around PFAS-contaminated excavation areas (see Expansion Area/Work Area Boundary in Attachment 1). Soils will be excavated with excavators and loaded into end-dumps. For soils that will be stockpiled, end-dumps will transport soils across the project site to storage site, back into the site through a single access point, and dump materials directly onto an approved liner. Soils will then be high-piled using a front-end loader.

3. All equipment leaving the PFAS-contaminated work area will be decontaminated (see Decontamination Procedures below) before driving to the stockpile area. If equipment comes into contact with contaminated soil in the stockpile area, it will also be decontaminated prior to leaving the stockpile area.
4. If contaminated soil that is to be returned to its original site needs to be temporarily stored, it will be placed on a lined containment area, covered and flagged until it can be backfilled. The depth from which the soil was excavated will be noted on the cover, and soil will be replaced as close to that depth as possible. (Maximum excavation depth is estimated to be 5' deep; average 3' deep). If returning it to the same approximate depth is not possible, the contaminated soil will be stockpiled (see Stockpile Procedures below).
5. DOT&PF does not expect excavation dewatering to occur. If excavation dewatering is needed, the Contractor will obtain a DEC Excavation Dewatering General Permit. BMPs for dewatering in contaminated soil areas will be outlined during that process.
6. Operators will work from the safety of their respective equipment cabs. Manual labor to excavate soils is not expected. If manual/ground labor is necessary, personnel will wear proper PPE and follow decontamination procedures.

Stockpile Procedures

Material from PFAS-contaminated areas will be stockpiled on a DOT&PF property (58° 25′ 15″ N 135° 41′ 30″ W) on the northeast side of the main runway, Runway 11/29 (see Attachment 1 for stockpile location). It is the former location of firefighting training and AFFF dispersal area. This site is located approx. 2,200' from the Airport Terminal well and approx. 3,400' from the NPS well. The closest surface water is approx. 190' from the storage site. A portion of excess non-PFAS-contaminated pulverized pavement and gravel from the project will be used to build an elevated pad which the PFAS-contaminated material will then be stored on to prevent inundation by airport-wide flooding events.

Stockpiling will meet all specifications listed in 18 AAC 75.370, in addition to the specifications listed here:

1. Excavated material must be segregated based on the intended cleanup alternatives and the specific hazardous substance present. – Because it will be assumed that all soil excavated from the PFAS-contaminated excavation area shown in Attachment 1 has PFAS present and will be stored in the stockpile location.
2. Soil stockpiles must be at least 100 feet from surface waters and at least 200 feet from public drinking water supply wells.
3. Stockpiles must be constructed to prevent effluent from migrating to clean areas by using bottom and top PVC liners. The table below provides specifications for bottom liners. The top liner will be a minimum 11 mil polyethylene product or equivalent.

TABLE D. BOTTOM LINER SPECIFICATIONS		
Method	**Coated Fabric**	**Extruded Fabric**
Black carbon content (ASTM D 1603-06, updated March 2006)	2% or greater	2% or greater
Tensile strength (ASTM D 751-06, updated May 2006)	300 lbs (warp)	N/A
Mullen burst (ASTM D 751-06, updated May 2006)	500 psi	N/A
One inch tensile strength (ASTM D 882-02, updated June 2002)	N/A	45 lbs (warp)
One inch elongation MD (machine direction)	N/A	625%
Nominal thickness	20 mil	20 mil
Oil resistance (ASTM D 471-06, updated November 2006)	No signs of deterioration and more than 80% retention of tensile and seam strength after immersion for 30 days at 73° F.	No signs of deterioration and more than 80% retention of tensile and seam strength after immersion for 30 days at 73° F.
The American Society for Testing and Materials (ASTM) methods referred to in this table are adopted by reference. "N/A" means not applicable.		

a. Edges of the bottom liners will fold back up and over the wattle and stockpile base by a minimum of five feet to contain any "settlement" and subsequent leaks from within. See Attachment 2 for a diagram and example of the soil, wattle placement, and liner.
    i. Wattles (dry straw or similar commercial or locally constructed absorbents) will be placed at the base of each stockpile directly in contact with the soil. The wattle becomes a part of the contaminant and will be treated as such during future remediation.
b. The top cover will overlap the bottom liner's edge by at least three feet.
c. When excavation of PFAS-contaminated materials is complete, stockpiles and liners will be lashed down with ropes and anchored with 60 lb. sandbags which will be replaced every two years or as needed.
d. If the stockpiles will remain longer than two years, the bottom and top liners will be replaced every two years.

4. Stockpiles will be completely covered and weighted during hours of inactivity (e.g.: evenings and weekends).
5. Stockpiles will be adequately marked.
    a. Traffic safety cones or candlestick bollards are required around the perimeter of the stockpile.
    b. Eight Public Health and Safety Signs (2 per side) will be placed around the perimeter of the stockpile at equidistant spacing. The signs will have a durable backboard and be weatherproof with letters readable from 20' away showing: contaminant of concern, point of contact for the Contractor (name and phone number), point of contact for the DOT&PF (name and phone number), state project number, and generation date. Signs will be maintained in readable condition and in place for the entirety of the soil's storage. See Attachment 3 for a template.

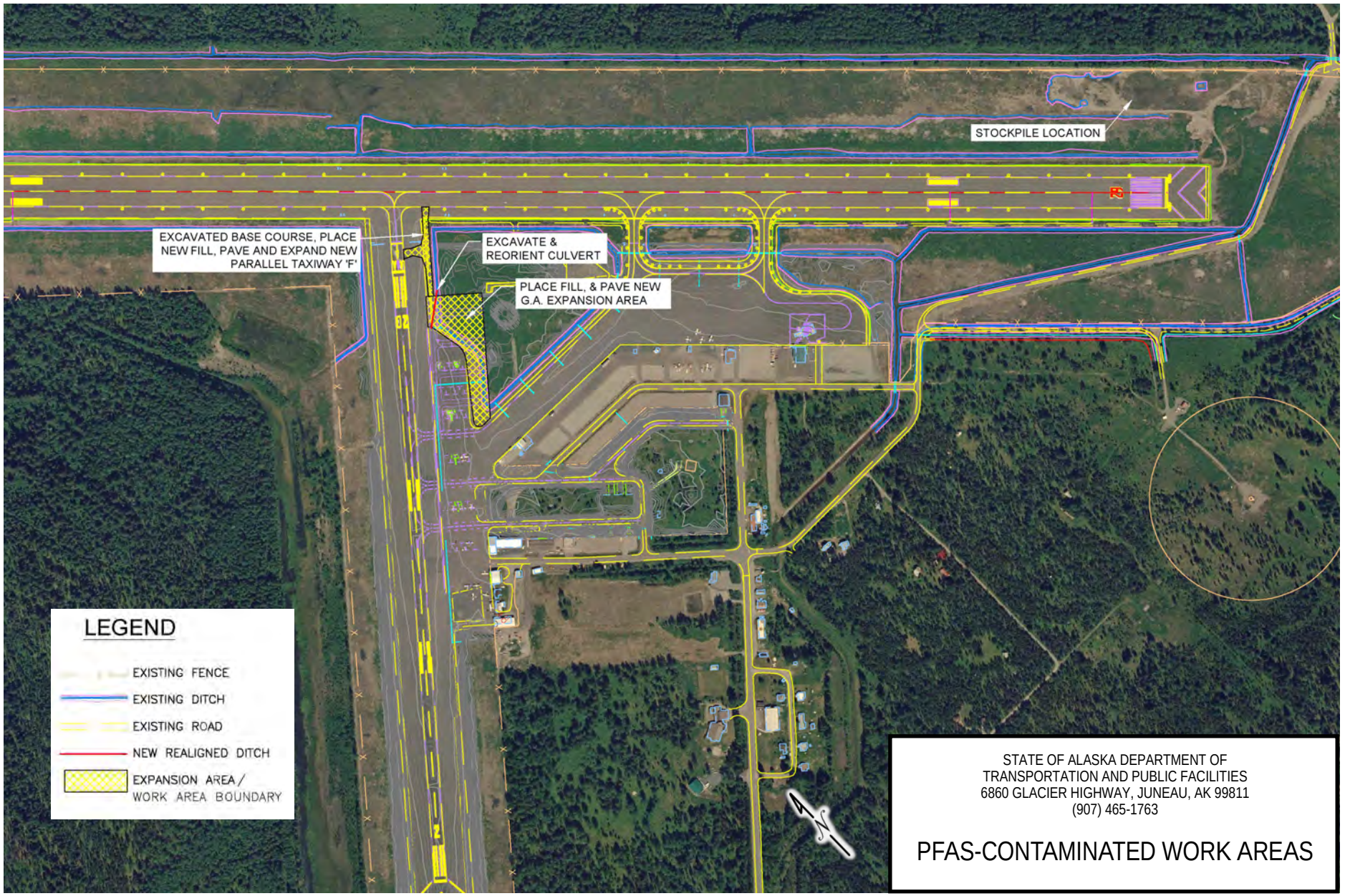
6. Stockpiles will be regularly inspected and maintained to ensure the cover remains intact, excessive water does not accumulate, wattles remain in place, signs are legible and in place, and safety warning devices (traffic cones or bollards) are present and upright. Stockpiles will be inspected daily by the Contractor during active construction and a minimum of monthly by Gustavus DOT&PF staff during storage periods. Inspections will be documented and records sent biannually to DEC (see Reporting Procedures below). Any access openings made to the liner (accidental tears, etc.) shall be immediately sealed off to prevent wind and rain intrusion.
    a. DOT&PF does not anticipate leachate will be generated at the stockpile during rain events because it will be securely covered. In the unlikely event that leachate does occur, it will be pumped out of the stockpile area and containerized.

Decontamination Procedures

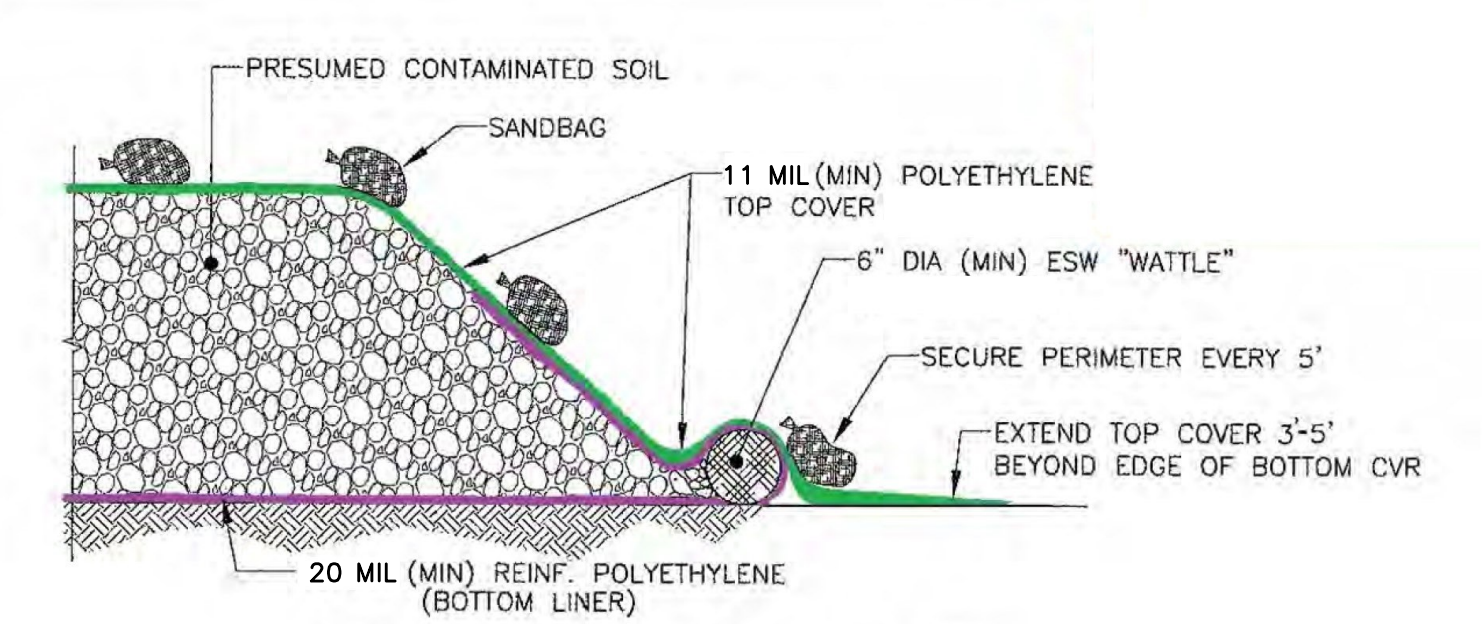
All heavy equipment used in PFAS-contaminated excavation areas (see Expansion Area/Work Area Boundary in Attachment 1) will be brushed to remove visible soil before leaving the work area boundary. If equipment comes into contact with contaminated soil in the stockpile area, it will also be brushed to remove visible soil prior to leaving the stockpile area. Hand tools are not anticipated to be used in the designated work area. If they are, they will be brushed to remove visible soil as well.

Reporting Procedures

When project work is completed, the Contractor will submit a report to DEC and DOT&PF that includes a summary of soil movement including how much material was placed in the stockpiles, how much PFAS-contaminated material was placed back in the ground, date and time of daily inspections during active construction and any notes (accidental tears, runoff, etc.), and photographs. Gustavus DOT&PF staff will conduct monthly inspections during storage. DOT&PF will submit documentation of those inspections (a log of date, time, and any necessary notes such as accidental tears, flooding in the area, leachate, etc.) with photos biannually in May and October each year via email.


STOCKPILE LOCATION
EXCAVATED BASE COURSE, PLACE NEW FILL, PAVE AND EXPAND NEW PARALLEL TAXIWAY 'F'
EXCAVATE & REORIENT CULVERT
PLACE FILL, & PAVE NEW G.A. EXPANSION AREA
LEGEND
EXISTING FENCE
EXISTING DITCH
EXISTING ROAD
NEW REALIGNED DITCH
EXPANSION AREA / WORK AREA BOUNDARY
STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
6860 GLACIER HIGHWAY, JUNEAU, AK 99811
(907) 465-1763
PFAS-CONTAMINATED WORK AREAS

Example of a Cross-Section Diagram of Proper Stockpile Storage:



Example of a Stockpile from Eielson AFB Restoration Program's Stockpiling Contaminated Soils Standard Operating Procedure:

PFAS-CONTAMINATED MATERIAL
DO NOT DISTURB

[CONTRACTOR COMPANY NAME]

[POC NAME] [POC PHONE #]

DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

[POC NAME] [POC PHONE #]

STATE PROJECT NO. Z675170000

GENERATION DATE: MONTH/DATE/YEAR

Soil Management Plan: Appendix 1

ADEC File No. 1507.38.017

Gustavus Airport Apron, Runway, and Taxiway
Pavement Rehabilitation Project

State Project No. Z675170000

Prepared by
DOT&PF
Southcoast Region

The environmental review, consultation, and other actions required by Federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

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Abbreviations

AFFF	aqueous film forming foams
ASTSWMO	Association of State and Territorial Solid Waste Management Officials
c.y.	cubic yards
DEC	Alaska Department of Environmental Conservation
DHSS	Department of Health and Social Services
DOA	Department of Administration
DOT&PF	Department of Transportation and Public Facilities
DRC	Gustavus Disposal & Recycling Center
EH	DEC's Division of Environmental Health
EPA	U.S. Environmental Protection Agency
GST	Gustavus Airport
NPS	National Park Service
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonate
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PPE	personal protective equipment
ppt	parts per trillion
PRG	preliminary remediation goal
REM	DOT&PF Regional Environmental Manager
SMP	Soil Management Plan
SPAR	DEC's Division of Spill Prevention and Response

1.0 Introduction

This Soil Management Plan (SMP) provides direction for managing disturbed contaminated soils during the Alaska Department of Transportation and Public Facilities' (DOT&PF) Gustavus Airport Apron, Runway, and Taxiway Pavement Rehabilitation project (State Project No. Z675170000) at the Gustavus Airport (GST) in Gustavus, Alaska. GST is an active Alaska Department of Environmental Conservation (DEC) listed contaminated site due to concentrations of Per- and Polyfluoroalkyl Substances (PFAS), specifically perfluorooctane-sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), in the groundwater and surface water (File Number 1507.38.017, Hazard ID 26904). The presumed source of PFAS is the Federal Aviation Administration-mandated use of fire-fighting aqueous film forming foams (AFFF) at Aircraft Rescue and Firefighting testing areas.

The planned work includes:

- resurface and rehabilitate existing taxiways, aprons, and runways;
- add new taxiways F and G;
- install new lighting as needed for taxiway F;
- expand, grade, and pave the General Aviation Apron, new taxiway F, and new taxiway G, including:
  - place 0-6' of fill in expanded General Aviation Apron area,
  - remove and replace existing hardstands and tie-downs, and
- groove and stripe where necessary.

The original scope of work also included realigning the ditch around the expanded General Aviation Apron and extending two existing culverts near the expansion area. They were removed from the project to minimize the excavation of PFAS-contaminated soil. All current drainage and water flow will be maintained. See Figures 1 and 2 for project maps and plans.

In total, project work will disturb 2,000 cubic yards (c.y.) of potentially PFAS-contaminated material from excavation associated with the extension of taxiways. Of the 200 c.y. disturbed, 110 c.y. can be returned to the area it came from and capped (paved over) to prevent potential PFAS migration. The preferred alternative, storage site #2, which has the least potential impacts, will be used to store the remaining 1,890 c.y. of excess PFAS-contaminated soil until a later disposal date (see Section 4.3b for analysis of storage site #2). The following methods were analyzed for PFAS-contaminated soil management: soil destruction via thermal treatment, soil disposal via the Gustavus landfill, soil disposal via the Juneau landfill, and soil storage at three different locations. See Section 4.0 Soil Management Options for full analysis of each method and a comprehensive breakdown of excavated materials, PFAS-contaminated soils, and stockpile quantities.

2.0 PFAS Information and Guidance

PFAS are a group of over 4,000 synthetic chemicals used in a variety of materials such as nonstick cookware, stain resistant products for carpet and textiles, firefighting foams, waterproofing for outdoor clothing and gear, food packaging, and miscellaneous cleaning products, paints, and sealants. They have

been in use since the 1940s and are called "forever chemicals" because of their strong carbon-fluorine bonds, which can take years, decades, or longer to break down naturally in the environment. People can be exposed to PFAS by using the products listed above, drinking contaminated water, eating plants or animals with accumulated PFAS, or exposure through employment at a workplace that produces or uses PFAS. Studies indicate that some PFAS accumulate in the human body and can lead to adverse health outcomes such as reproductive and developmental issues, effects on the liver and kidney, and increased cholesterol levels. There are limited findings that also suggest PFAS can cause cancer, affect infant birth weights, cause thyroid hormone disruption, and have adverse effects on the immune system.

Currently PFAS are an EPA chemical of concern, and the EPA is beginning the necessary steps to propose listing PFOS and PFOA (two types of PFAS) as "hazardous substances." Federal and State of Alaska guidance and regulations concerning the management of PFAS and PFAS-contaminants to date are as follows:

May 2016	EPA publishes a Lifetime Health Advisory (LHA) level of 70 parts per trillion (ppt) for the cumulative amount of PFOS and PFOA in drinking water.
November 2016	DEC publishes groundwater cleanup levels of 400 ppt for the cumulative amount of PFOS and PFOA in groundwater. Prior to the publication of these levels, there were no state issued cleanup levels for PFAS.
August 2018	DEC sets action levels for six PFAS in their *Technical Memorandum Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water*. A 70 ppt action level was set for the sum of five PFAS: PFOS, PFOA, perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and perfluoroheptanoic acid (PFHpA). A separate action level of 2000 ppt was set for perfluorobutane sulfonate (PFBS).
October 2018	DEC issues proposed regulatory cleanup levels for six PFAS in soil and groundwater for public comment. Comment period closed on November 13, 2018. The proposed amendments are on hold by the department.
February 2019	*EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan* is published outlining concrete steps the agency was taking to address PFAS and to protect public health, including moving forward with the Maximum Contaminant Level (MCL) process for PFOA and PFOS.
April 2019	DEC publishes a revised *Technical Memorandum Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water* which supersedes the previous version from August 2018 and changes the action levels: "In order to align state actions to the recently announced EPA plans, DEC will use the EPA LHA (PFOS+PFOA above 0.07 μg/L) as the Action Level. Any new testing for PFAS will be for PFOS and PFOA only."

October 2019	DEC publishes another revised *Technical Memorandum Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water* which supersedes both previous versions (Aug 2018 and Apr 2019). It stated: "Any new testing for PFAS will report the full suite of PFAS compounds analyzed by the appropriate EPA method."
December 2019	EPA issues memo *Interim Recommendations for Addressing Groundwater Contaminated with Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonate (PFOS)* which focuses on groundwater that is a current or potential source of drinking water. It recommended a screening level of 40 ppt for PFOS and PFOA and 70 ppt as the preliminary remediation goal (PRG).
December 2020	EPA issues *Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances* for public comment. The draft guidance outlines current knowledge of methods to treat or store PFAS and PFAS-containing materials from non-consumer products.

In the EPA's most recent guidance on PFAS, *Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances*, they note throughout the document the significant uncertainties in current remediation methods of PFAS. On January, 21, 2021, the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) hosted the webinar *Interim Guidance on Destroying and Disposing of Certain PFAS and PFAS-Containing Materials That Are Not Consumer Products*. They again echoed the many uncertainties with destroying or disposing PFAS.

To date, there are no regulatory text or statutes for the disposal or treatment of PFAS. EPA and DEC are actively working to fill knowledge gaps that will help managers of PFAS to better remediate contaminated sites. While we wait for a solution that we know will be 100% safe and effective to remediate this site as well as other contaminated sites around the state, DOT&PF continues to build capacity and knowledge to ensure our priorities and projects are in the public's best interest. This Soil Management Plan, the bi-weekly meetings with DEC and DOT&PF staff for this project, and the revisit of the project's design to reduce disturbance of PFAS-contaminated soil are just a few examples of that ongoing effort.

3.0 Background

GST, located at 1 Airport Way in Gustavus, Alaska, is owned by the DOT&PF. On May 4, 2018, DEC informed DOT&PF the airport terminal well and National Park Service (NPS) Water System well, both located on DOT&PF property at GST, were at risk for PFAS-contamination. The NPS well supplied drinking water to NPS facilities and Gustavus' school. See Figure 6 for a map of wells and potential AFFF areas. On June 27, 2018, DOT&PF sampled both wells for the presence of PFAS. The analytical results, received on July 30, 2018, showed that the airport terminal well contained levels of PFAS exceeding the EPA's LHA level of 70 ppt. The NPS well had detections of several PFAS less than the EPA's LHA level of 70 ppt.

In August 2018, DOT&PF sent out letters to property owners within the potentially affected area for well water sampling. They also hosted a public information meeting at the Gustavus Library with the DEC, Department of Health and Social Services (DHSS), and Department of Administration (DOA). Also in August 2018, DOT&PF contracted environmental consulting firm Shannon & Wilson, Inc. (Shannon & Wilson) who began private well search and sampling efforts. Shannon & Wilson's Work Plan for Gustavus and GST includes the following activities:

- collection of 14 surface soil samples, with additional surface soil samples collected from two potential AFFF release locations;
- collection of 10 samples from surface water near the GST;
- installation and sampling of 8 temporary well points;
- installation and sampling of 15 monitoring wells at 12 locations (some locations include two wells screened at different depths);
- groundwater elevation survery to estimate groundwater flow and direction and gradient;
- laboratory analysis for the above-listed samples; and
- evaluation and reporting of the analytical data.

After the first round of private well sampling by Shannon & Wilson in August 2018, DOT&PF began providing bottled drinking water to those homes with PFAS levels above the EPA's LHA level of 70 ppt.

As of April 2020, Shannon & Wilson have sampled 113 private wells, 17 surface water samples, 9 subsurface soil analytical samples, 41 primary surface soil samples, and 9 sediment samples as well as installing and sampling 15 monitoring wells and 8 temporary well points. All results are sent to DEC and a map of the results is published on DOT&PF's Gustavus Airport website.[1] The DOT&PF continues public outreach to the community of Gustavus via regular community updates after sampling events and has held several public meetings in the town of Gustavus while they work with an interagency team to find long term water source options.

4.0 Material Produced During Project Work

In total, there will be 28,250 c.y. of material created (via cold planing, excavation, pulverizing or milling) on this project. The vast majority of this material is pulverized pavement or a blend of pulverized pavement and pulverized gravel and are not PFAS-contaminated. Of the 28,250 c.y. of material generated, 13,222 c.y. will be used as fill during project work. Excess non-PFAS-contaminated material will be stockpiled per FAA standards separately from PFAS-contaminated soil (see storage site #2 in Section 4.3b below) on a site on the northeastern side of the main runway, Runway 11/29. See the table below for an estimated breakdown of all material produced project work. Refer to Figure 2 for a map with locations.

[1] http://dot.alaska.gov/airportwater/gustavus/

Table 1. Material Generated During Project Work

LOCATION	PFAS-CONTAMINATED?	MATERIAL GENERATED (cu. yards)[1]	DESCRIPTION	REMOVAL METHOD	NOTES
Taxiway 'A'	No	100	Pulverized Pavement	Cold Planed	
Taxiway 'B'	No	100	Pulverized Pavement	Cold Planed	
Taxiway 'D' & 'E'	No	200	Pulverized Pavement	Cold Planed	
Taxiway 'D' Extension	No	100	Pulverized Pavement	Cold Planed	
Taxiway 'C' part "CC"	No	60	Pulverized Pavement	Cold Planed	
Taxiway 'D' part "DD"	No	60	Pulverized Pavement	Cold Planed	
Taxiway 'E' part "EE"	No	60	Pulverized Pavement	Cold Planed	
Taxiway 'F'	Yes	90	Excavated base course	Excavated	Store at Storage Site #2 (see Section 4.3b)
Taxiway 'F' connect to R/W 11/29	No	20	Pulverized Pavement	Cold Planed	
Taxiway 'G'	No	50	Pulverized Pavement	Cold Planed	
Heavy Aircraft Apron	No	1600	Blend of Blend of Pulverized Pavement and Pulverized Gravel	Pulverized and blended with underlying gravel in-place	2058 c.y. fill needed
Heavy Aircraft Apron Lots	No	600	Pulverized Pavement	Cold Planed	
Air Taxi Apron	No	700	Blend of Pulverized Pavement and Pulverized Gravel	Pulverized and blended with underlying gravel in-place	745 c.y. fill needed
Air Taxi Lots	No	500	Pulverized Pavement	Cold Planed	
General Aviation Apron	No	6400	Blend of Pulverized Pavement and Pulverized Gravel	Pulverized and blended with underlying gravel in-place	
New Culvert Reorientation to North	Yes	110	Gravel underlying existing pavement	Excavated	Use as fill under G.A. Expansion Area + cap
General Aviation Lots	No	100	Pulverized Pavement	Cold Planed	
Runway 11/29	No	12400	Pulverized Pavement	Cold Planed	
Runway 11/29 Blast Pads	No	1300	Pulverized Pavement	Cold Planed	
Runway 2/20 with Blast Pads	No	3200	Blend of Pulverized Pavement and Pulverized Gravel	Pulverized and blended with underlying gravel in-place	
G.A. Expansion Area	No	0			10,400 c.y. of fill req'd
RW 11/29 Crack Repair	No	500	Pulverized Pavement	Profile Mill	

There is an additional estimated 1800 cubic yards contaminated material from clearing and grubbing in the G.A. Expansion Area and Taxiway 'F.'

Removal method definitions are:

- *Cold planning*, also referred to as "asphalt milling," is the controlled removal of the surface of existing pavement to the desire depth, with specially designed equipment to restore the pavement surface to a specified grade and cross-slope.
- *Excavation* is the process of moving earth, rock or other materials with tools or equipment.
- *Pulverizing*, the first stage in reusing asphalt to repave the same area, is similar to milling. Pulverization leaves several inches of ground-up asphalt where the old asphalt paving used to be.
- *Profile mill* is a process that removes part of a paved surface layer by layer.

All of the removal methods used with the exception of excavation are conducted only on pre-existing asphalt. DEC contaminated sites program does not regulate asphalt.

5.0 Soil Management Options

Of the 28,250 c.y. of material created during project work, only 2,000 c.y. is potentially PFAS-contaminated material. Of that 2,000 c.y., 110 c.y. will be returned to the area where it came from and capped (paved over). The remaining 1,890 c.y. will be need to be treated, disposed or stored. Each method is analyzed below.[2]

5.1 Soil Destruction via Thermal Treatment

Thermal treatment via hazardous waste combustors (such as commercial incinerators, cement kilns, and lightweight aggregate kilns) or other thermal treatments (such as carbon reactivation units, sewage sludge incinerators, municipal waste combustors, or thermal oxidizers) of PFAS-contaminated soils is an option for contaminant destruction. A combination of temperature and treatment time can potentially break apart the PFAS contained in the waste stream. However, soil destruction via thermal treatment has a high level of uncertainty regarding its capacity to manage the migration of PFAS into the environment. EPA currently has no emission characterizations from these sources (meaning the potential of PFAS to be released into the air and surrounding environment) when they burn PFAS. They are currently working with states, hazardous waste combustion facilities, and managers of PFAS-containing materials to obtain more information on this treatment method.

The closest commercial incinerators to GST are in Juneau, Alaska, and were taken out of service in 2004 after 20 years of use at the Juneau landfill. There are two commercial incinerators located in Ketchikan, Alaska, at the Ketchikan Solid Waste Facility. Currently there are no DEC classified PFAS-contaminated sites in Ketchikan. The incinerators are also located less than 800' from residential housing. Because of the close proximity to residential house and current uncertainties concerning emissions, the Ketchikan incinerators should be eliminated from consideration. There are no other thermal treatment facilities located in Southeast Alaska currently.

[2] Underground injection, only appropriate for liquid phase PFAS, will not be analyzed here as it is not applicable for this project which will only be dealing with solid phase contaminated soils.

5.2 Soil Disposal

PFAS-contaminated soil may also be disposed of via hazardous waste or municipal solid waste landfills. Permitted hazardous waste landfills employ the most extensive set of environmental controls and practices and, as a result, would be the more effective of the two types of landfill for minimizing PFAS migration into the environment. Municipal solid waste landfills with the appropriate controls such as a liner system and leachate and gas collection and management systems, can also control migration of PFAS into the environment. Key uncertainties with both classes of landfills include current leachate control technologies, effectiveness of leachate treatment for PFAS removal, liner integrity, and gaseous emissions from landfills. Again, the EPA is working to fill this gap in knowledge to better evaluate this disposal method for PFAS and PFAS-containing wastes.

There are two landfill options for soil disposal on this project. Gustavus Disposal and Recycling Center (DRC) is the closest to the project site and would require minimal transport. Capital Disposal Landfill is approx. 70 miles by boat from Gustavus and would require shipping contaminated soils by barge. Both landfills are analyzed as potential disposal locations for PFAS-contaminated soil below.

5.2a Disposal via the Gustavus Landfill

The Gustavus DRC, located in the middle of Gustavus, Alaska, is operated by the City of Gustavus. It is a DEC permitted Municipal Class III Community Active landfill. It can accept the following waste types: ash, C&D (construction & demo), inert, and municipal. They process ~170 tons of solid waste annually: 57% is recyclable, 43% non-recyclable, and 102 cubic yards of C&D waste (uncompressed). They also have a robust food composting program, composting 66,680 pounds in FY19 and 45,700 pounds in FY18. The DRC is located on a 12 acre site located on well drained, sandy soil with a high water table. See Figure 3 for landfill map. The Gustavus DRC does not have a liner or a leachate or gas collection system. Because it lacks these essential systems to handle PFAS or PFAS-contaminated soils, it cannot be considered as a potential disposal site. The DRC is also located within close proximity to residential houses and the Salmon River, an anadromous salmon stream (shown in Figure 3). Also worth noting: the location of the landfill is outside the PFAS-affected area, so any PFAS or PFAS-contaminants brought there could potentially spread contamination into a new area. The addition of 1800 c.y. of PFAS-contaminated material, approx. 3,240 tons, also has an added cost to the community of Gustavus in that it would reduce the landfills useful lifespan by an estimated 6-9 years at the current rate of use. This option should be eliminated from consideration.

5.2b Disposal via the Juneau Landfill

Capitol Disposal Landfill, located in Juneau, Alaska, is operated by private contractor Waste Management. It is a DEC permitted Municipal Class I landfill. It can accept the following waste types: C&D, inert, municipal, NonRACM, and treated medical waste. They process ~30,000 tons of solid waste per year. The landfill is located on a 40 acre site in the middle of a residential area, Lemon Creek. See Figure 4 for landfill map. Capitol Disposal Landfill does not have a liner, and leachate control, sampling, and management are not required by the site permit. Liquids are removed from the landfill using a collection system at various locations around the landfill which is directly discharged to a sewer system

treated by a Publicly Owned Treatment Works facility. The landfill is also in the process of updating its gas collection and monitoring plan, referred to as a "work in progress" in its last permit application from 2015. Because Capitol Disposal Landfill does not have a liner, its leachate is released into a sewer system rather than treated onsite, and its gas collection and monitoring system is currently being redesigned, it cannot be considered as a potential disposal site. The landfill is also located within close proximity to residential houses (~700') and Lemon Creek, an anadromous salmon stream (shown in Figure 4). Also worth noting: Capitol Disposal Landfill is currently not listed as a PFAS-contaminated area, so any PFAS or PFAS-contaminants brought there could potentially be spreading the contamination into a new area. This option should be eliminated from consideration.

5.3 Soil Storage at GST

EPA's recommendation concerning storage of in their most recent guidance on PFAS in their *Interim Guidance* states: "While not a destruction or disposal method, interim storage may be an option if the immediate destruction or disposal of PFAS and PFAS-containing materials is not imperative. In general, interim storage (estimated to be anywhere from 2 to 5 years) would be utilized until research reduces the uncertainties associated with other options" (p. 4). The DEC does not currently have storage guidelines for PFAS-contaminated soils, but 18 AAC 75.370 Soil Storage and Disposal for Oil and Other Hazardous Substances provides a guideline for storage. It states that contaminated soil must be segregated from other soils, stored 100 feet from surface water, stored 200 feet from a community water system, placed on a liner meeting certain specifications, covered with a second liner, and visually inspected regularly.[3]

There are three potential areas for storage at GST for excess PFAS-contaminated soil: an empty lot near taxiways D and E, an empty lot on the northeastern side of the main runway, and dispersing the soil next to the new general aviation apron expansion. See Figure 6 for a map of all potential storage locations analyzed below.

5.3a Storage Site #1

Storage site #1 is a DOT&PF lot adjacent to Runway 2/20 and between Taxiways "D" and "E" near privately leased lots and aircraft hangars (58° 25′ 22″ N 135° 42′ 35″ W). This site is located approx. 1,300' from the Airport Terminal well and approx. 1,500' from the NPS well. The closest surface water is approx. 900' from the storage site (see Figure 5 for a map of surface water in the area). Liners meeting the specifications listed in 18 AAC 75.370 will be used to store soil. Soil will be placed on the bottom liner at a height of ~5'. The entire footprint will be 105' by 105'. The site will be visually inspected regularly by DOT&PF personnel until its removal. See Figure 6 for a map of the storage site in respect to the project area and well locations.

This site has the most potential for access by the public of the three storage locations because of its proximity to privately leased lots and aircraft hangars. It is also in an area that has not been tested for PFAS (although the liners will prevent new contamination in this area). But because storage site #2 (see

[3] This is a paraphrase of the statue. See 18 AAC 75.370 for full text/specifications.

analysis in Section 4.3b) has less potential impacts, it is the preferred alternative, and this option should be eliminated from consideration.

5.3b Storage Site #2 – Preferred Alternative

Storage site #2 is on a DOT&PF property on the northeast side of Runway 11/29, the main runway (58° 25′ 15″ N 135° 41′ 30″ W). It is the former location of firefighting training and AFFF dispersal area. This site is located approx. 2,200' from the Airport Terminal well and approx. 3,400' from the NPS well. The closest surface water is approx. 190' from the storage site. A portion of excess non-PFAS-contaminated pulverized pavement and gravel from the project will be used to build an elevated pad under the PFAS-contaminated material to prevent inundation by seasonal flooding events. Liners meeting the specifications listed in 18 AAC 75.370 will be used to store soil. Soil will be placed on the bottom liner at a height of ~5'. The entire footprint will be 105' by 105'. The site will be visually inspected regularly by DOT&PF personnel until its removal. See Figure 6 for a map of the storage site in respect to the project area and well locations. There is a monitoring well (MW-12-10) located in this area. The well will be flagged with high visibility markers by DOT&PF staff before project construction and remain clear of debris/obstacles.

This site is the preferred alternative because it has the least amount of potential impacts. It is located the furthest away from the Airport and NPS wells and also located the furthest away from public access. It is also in an area where AFFF were used previously and has already tested positive for PFAS (although the liners will prevent new contamination in this area). It is also on a separate drainage system (draining away) from exploratory wells being developed for future drinking water.

5.3c Soil Dispersal

The final option for storage is to return the soil as close to its original source as possible, next to the new general aviation apron expansion (58° 25′ 28″ N 135° 42′ 27″ W). The entire Gustavus Airport Sitewide is classified as a PFAS-contaminated site, and soil testing in the apron expansion area has shown the levels are above DEC cleanup levels. Because this area is a contaminated area and will have to be cleaned up, placing contaminated soil on top of it will not alter its contamination level. This site is located approx. 1,300' from the Airport Terminal well and approx. 2,000' from the NPS well. The closest surface water is approx. 900' from this site. Soil will be spread in a 1' layer in a 325' by 325' triangle shape (see Figure 6 for a map of the soil dispersal area). Sampling in this area by Shannon & Wilson will continue until the soil's removal/destruction as part of a future cleanup plan.

This option was eliminated after discussion with DEC because of its potential for further contamination. PFAS is a highly mobile contaminant able to spread through water and air. GST is a recently designated PFAS-contaminated site, and both DOT&PF and DEC are still learning how PFAS-contaminants are migrating through soils, surface water and ground water there. Storage via liners is option that provides the most public safety.

6.0 Procedures – see Soil Management Plan for Procedures

7.0 Health and Safety

Before project work begins all personnel will have PFAS training conducted by the Contractor working with DOT&PF Regional Environmental Manager (REM) or other DOT&PF staff designated by the REM. At a minimum, training will cover: introduction to PFAS compounds, potential pathways of exposure, human health effects, ecological health effects, decontamination, required PPE, and proper PPE removal. Periodic refresher trainings will occur quarterly during weekly safety meetings.

PPE will be required for all personnel working on the ground within the designated work area boundary. PPE selection will be based primarily on work-task requirements and potential exposure. All personnel shall wear OSHA HAZWOPER Level D PPE as a minimum:

- standard work clothes or cotton overalls
- reflective, high visibility safety vest, shirt or jacket
- safety-toe boots
- disposable boot covers
- safety glasses
- hard hat
- gloves

Disposable nitrile gloves will be worn during any activity that may require dermal contact with potentially contaminated media.

A decontamination station will be set up near the designated work boundary where personnel routinely enter/exit the work site. When exiting the work site, personnel will remove disposable over boots and disposable nitrile gloves (if applicable) and brush any contaminated soils from their work clothes or overalls. Personnel shall be instructed in proper decontamination technique, which entails removal of PPE in an "inside-out" manner. Periodically decontaminated items will be visually inspected for residual contamination to determine is decontamination procedures are effective.

8.0 References

Alaska Department of Environmental Conservation. "Action Plan and Levels for PFAS." https://dec.alaska.gov/spar/csp/pfas/action-plan/

Alaska Department of Environmental Conservation. (2018, August). *Raising Awareness of PFAS Chemicals in Alaska.* http://dot.alaska.gov/sereg/GST-AIP_PFA/assets/dec-pfas-trifold-factsheet-8-24.pdf

Alaska Department of Environmental Conservation. (2018, August 20). *Technical Memorandum Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water.* https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Alaska Department of Environmental Conservation. (2019, April). *Technical Memorandum Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water.* https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Alaska Department of Environmental Conservation. (2019, October). *Technical Memorandum Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water.* https://dec.alaska.gov/media/15773/pfas-drinking-water-action-levels-technical-memorandum-10-2-19.pdf

Alaska Department of Environmental Conservation. (2021, January 13) "Site Report: ADOT&PF Gustavus Airport Sitewide PFAS." https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Alaska Department of Environmental Conservation Solid Waste Information Management System (SWIMS). (2020, December 21). "Juneau Capitol Disposal Landfill." https://dec.alaska.gov/Applications/EH/SWIMS/AuthPermit.aspx?siteId=438&ID=2266

Alaska Department of Environmental Conservation Solid Waste Information Management System (SWIMS). (2021, January 12). "Gustavus Disposal & Recycling Center (DRC)." https://dec.alaska.gov/Applications/EH/SWIMS/ModFacility.aspx?siteId=3

Alaska Department of Transportation and Public Facilities. (2020, December 28). "Gustavus Airport Firefighting Testing Area Contamination." http://dot.alaska.gov/airportwater/gustavus/

Berry, Paul. (2020, February 11). "Community-Scale Composting in Rural Alaska Gustavus Disposal & Recycling Center." www.zendergroup.org/docs/compost2020pres.pdf

City and Borough of Juneau, WIH Resource Group, and Zia Engineering. (2008 February). *City and Borough of Juneau Alaska Solid Waste Strategy – Final Report*. https://juneau.org/engineering-public-works/recycleworks/projects-plans

City of Gustavus. (2020, August). *Gustavus Solid Waste Landfill, Solid Waste Permit No. SW3AO17-25.* https://dec.alaska.gov/Applications/EH/SWIMS/AuthPermit.aspx?siteId=3&ID=2734

City of Gustavus, Disposal & Recycling Center. (2019). *Fiscal Year 2019 Annual Report of Waste Processing, Income & Expenses*. https://cms.gustavus-ak.gov/drc

Shannon & Wilson, Inc. (2019, April). *August 2018 to November 2018 Private Well Sampling – Revision 1 Summary Report*. https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Shannon & Wilson, Inc. (2019, July). *Gustavus Airport PFAS Site Characterization Work Plan – Revision 1*. https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Shannon & Wilson, Inc. (2019, August). *Storm Water Pollution Prevention Plan for Fairbanks International Airport Fire Training Pit Correction Action*.

Shannon & Wilson, Inc. (2020, April). *Gustavus PFAS 2019 Site Characterization Revision 1 Summary*. https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Shannon & Wilson, Inc. (2020, July). *DOT&PF Statewide PFAS Revision 1 General Work Plan.* https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Shannon & Wilson, Inc. (2020, August). *December 2018 to November 2019 Water Supply Sampling FINAL Summary Report*. https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

Shannon & Wilson, Inc. (2020, August). *DOT&PF Statewide PFAS Addendum 002-GST-00 Gustavus Well Monitoring REVISION 01 General Work Plan Addendum*. https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26904

U.S. Environmental Protection Agency. "PFOA, PFOS and Other PFASs." https://www.epa.gov/pfas/basic-information-pfas

U.S. Environmental Protection Agency. (2019, February). *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan*. https://www.epa.gov/pfas/epas-pfas-action-plan

U.S. Environmental Protection Agency. (2019, December). *Interim Recommendations for Addressing Groundwater Contaminated with PFOA and PFOS.* https://www.epa.gov/sites/production/files/2019-12/documents/epas_interim_recomendations_for_addressing_groundwater_contaminated_with_pfoa_and_pfos_dec_2019.pdf

U.S. Environmental Protection Agency. (2020, February). *EPA PFAS Action Plan: Program Update February 2020*. https://www.epa.gov/sites/production/files/2020-01/documents/pfas_action_plan_feb2020.pdf

U.S. Environmental Protection Agency. (2020, December 18). *Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances.* https://beta.regulations.gov/docket/EPA-HQ-OLEM-2020-0527/document

U.S. Environmental Protection Agency. (2020, December 18). "News Releases: EPA Releases Interim Guidance on Destroying and Disposing of Certain PFAS and PFAS-Containing Materials." https://www.epa.gov/newsreleases/epa-releases-interim-guidance-destroying-and-disposing-certain-pfas-and-pfas-containing

Utah Department of Environmental Quality. (2020, January 31). "PFAS Basics." https://deq.utah.gov/pollutants/pfas-basics

Waste Management. (2015, November 17). *Class I Municipal Solid Waste Permit Application Alaska Department of Environmental Conservation Solid Waste Program.* https://dec.alaska.gov/Applications/EH/SWIMS/AuthPermit.aspx?siteId=438&ID=2266

Waste Management and SCS Engineers. (2015 December). *Closure, Post-Closure, and Financial Assurance Plan Capital Disposal Landfill Juneau, Alaska*. https://dec.alaska.gov/Applications/EH/SWIMS/AuthPermit.aspx?siteId=438&ID=2266

Figure 1. Project Vicinity Map

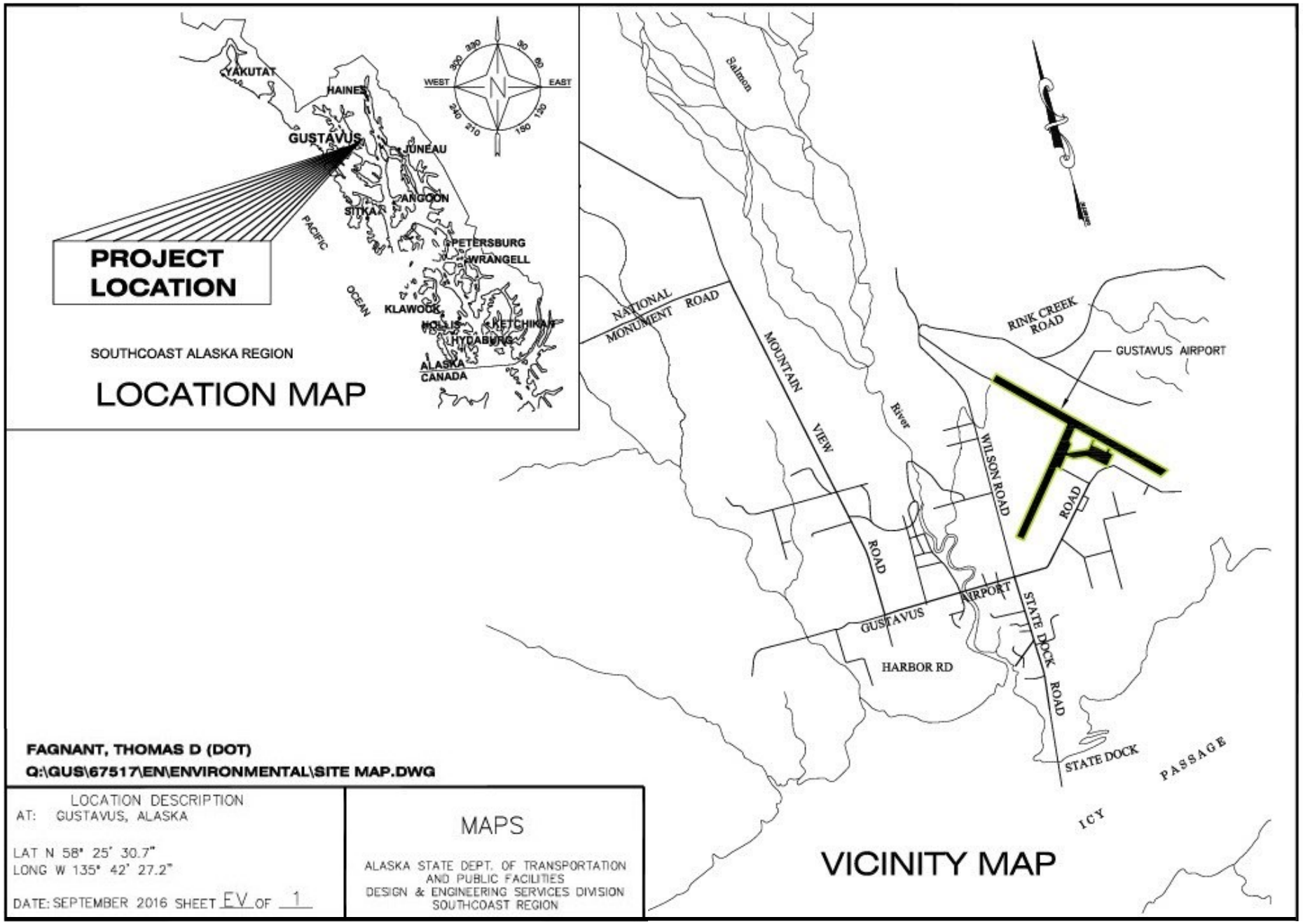

Figure 2. Project General Layout Plan

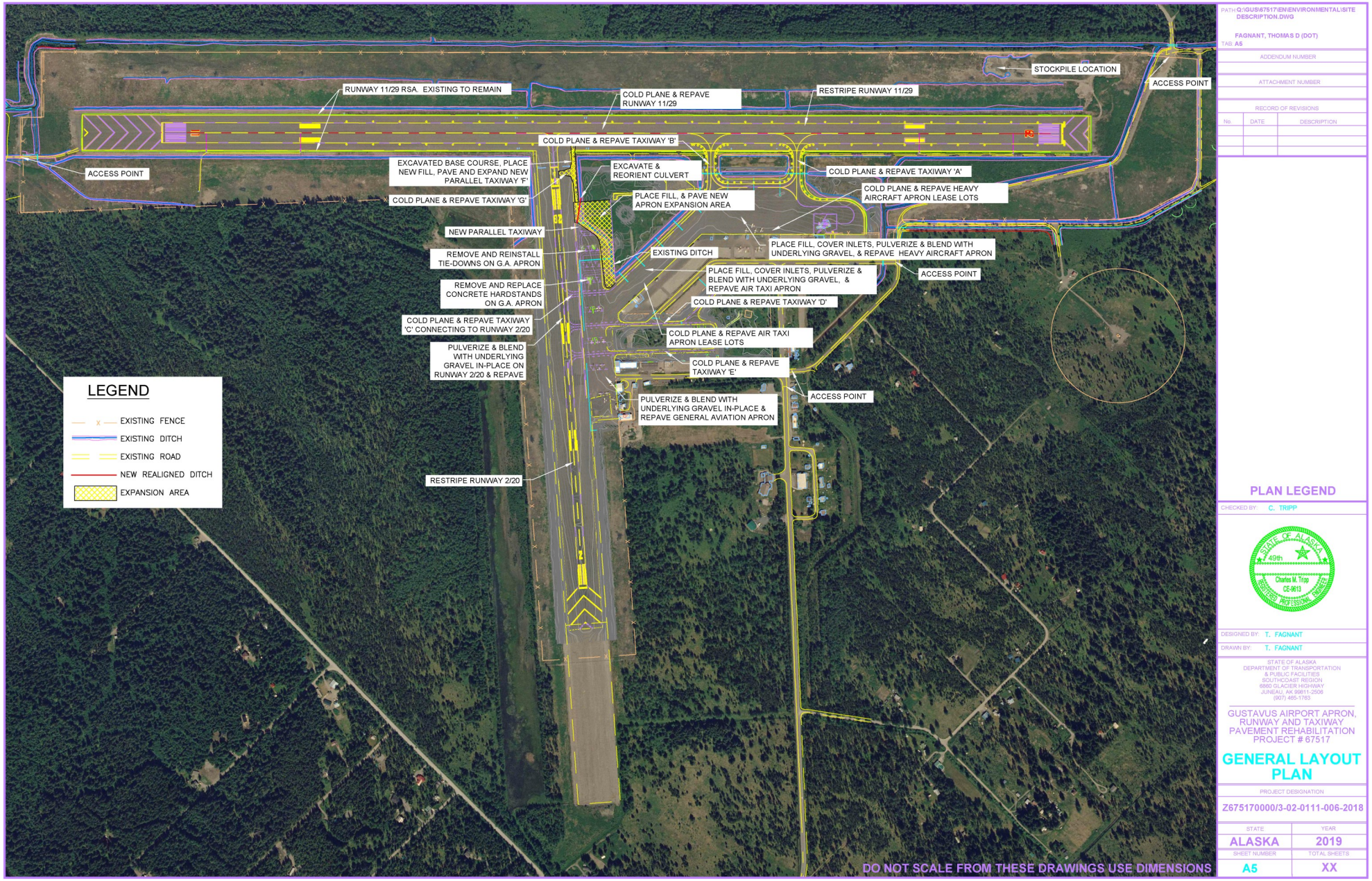

Figure 3. Gustavus Landfill

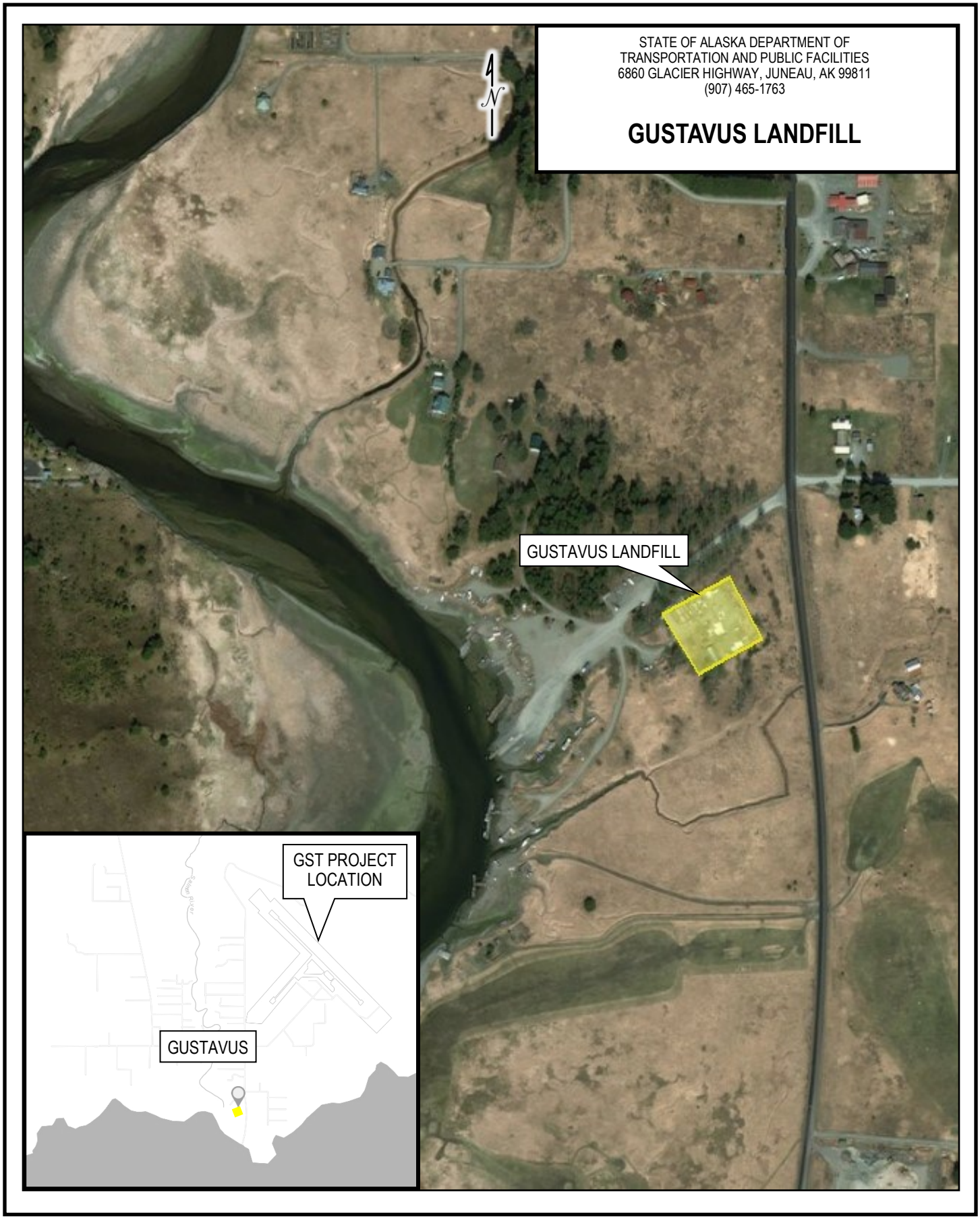

Figure 4. Juneau Landfill

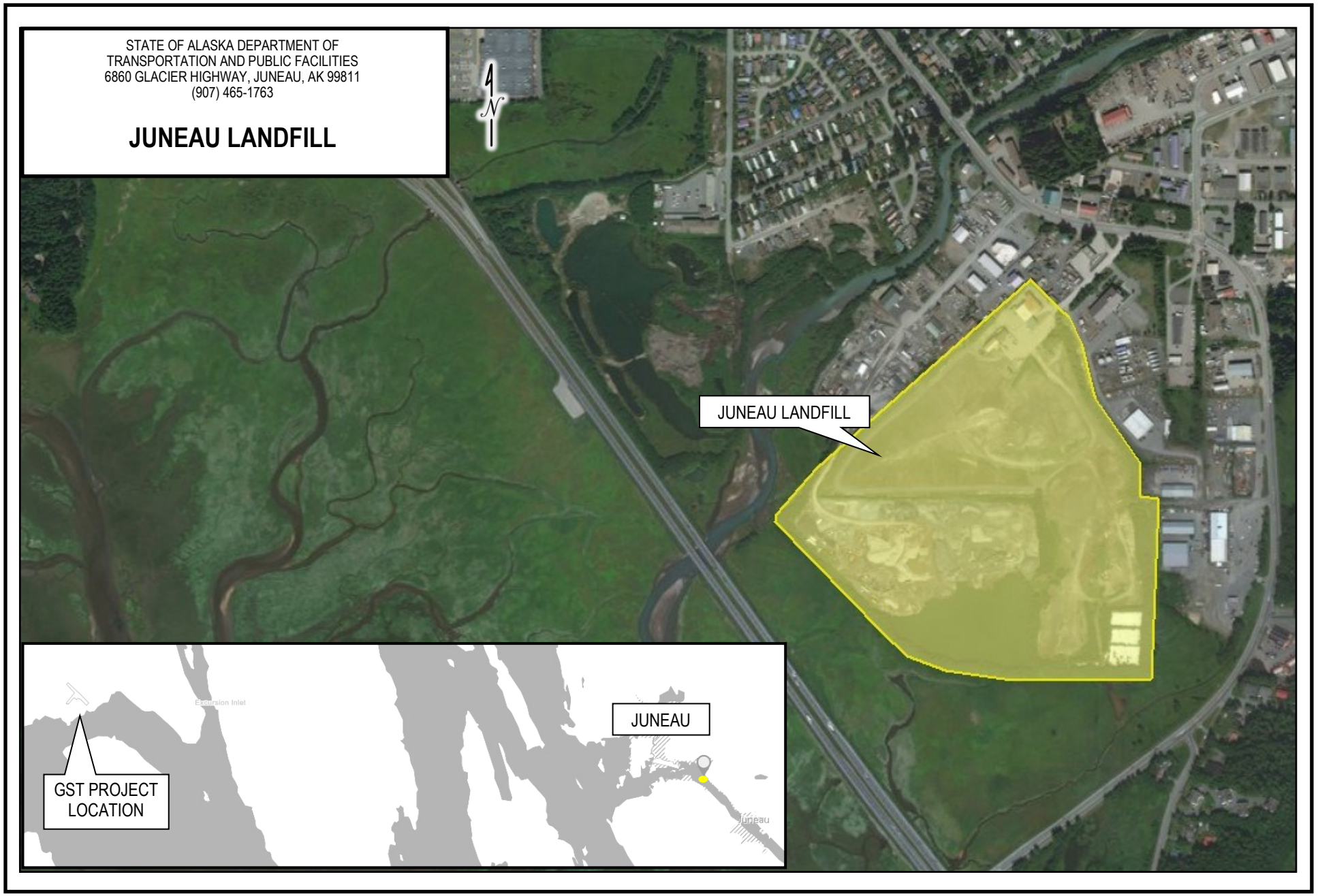

Figure 5. Surface Water

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

LEGEND

- Surface Water Body in Project Area
- Property Lines
- Airport Property Boundary

0 2,000 4,000

Feet

N

Note: Wildlife is prevalent throughout the site.
Highlighted portions include select known waterbodies/drainages.

Gustavus Airport
Gustavus, Alaska

SURFACE WATER BODIES IN PROJECT AREA ACCESSIBLE TO WILDLIFE

Map data provided by:

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Figure 6. Storage Sites with Wells