

September 17, 2025

This addendum forms a part of the contract documents and modifies the original bid documents for the project.

In case of conflicts between this addendum and previously issued documents, this addendum shall take precedence.

This Addendum consists of the following:

Addendum Language (Pages 1 through 10)

Contract Document Attachments:

Bid Form for Construction Contract

Updated Minimum Rates of Pay for Laborers and Mechanics, Issue 51

Revised Final Construction Materials Management Plan, September 2025

CSI Substitution Request Form – DM40

CSI Substitution Request Form – SR2

AWIP Product Data Sheets for DM40 and SR2

Pre Bid Meeting Attendance Sheet

Technical Specification Attachments:

Section 099100 –Painting

Section 312000 – Earth Moving

Section 312319 – Field Screening

Section 331100- Water Distribution Piping

Section 331613 – Potable Water Storage Tank

Drawing Attachments:

C-301, C-302, C-305, C-306, C-316, C-317, C-318, C-319, C-320, C-501, C-510, C-701

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CONTRACT SPECIFICATIONS

AD2.01 Advertisement For Bids

REPLACE Paragraph regarding bid date and location with the following:

Bids for the construction of the Project will be received by the RESPEC Administrative Assistant at 2700 Gambell St Suite 500, Anchorage, AK 99503 until **October 2 ,2025 at 2:00 PM** local time. Sealed bids must be marked “City and Borough of Yakutat- Airport Water Main Extension. Both hand delivered and mailed bids are acceptable. Please do not email your bid. Bids received will be publicly opened and read.

AD2.02 Bid Form for Construction Contract

REPLACE Entirely with attached.

AD2.03 Special Conditions

REPLACE SP-5 with

Clearing and grubbing shall be completed outside of the bird nesting window which is April 15th to July 15th in Southeast Alaska, to the fullest extent possible, in order to comply with U.S. Fish and Wildlife Service timing recommendations for land disturbance and vegetation clearing.

TECHNICAL SPECIFICATIONS

AD2.04 099113- Exterior Painting

INSERT Specification in its entirety.

AD2.05 312000- Earth Moving

REPLACE Entirely with attached Specification

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AD2.06 330523- Horizontal Direction Drilling

REMOVE 3.01. Installation of Pipe

- A. A cone shall be fabricated and attached to the pulling head that will protect the leading edge of the arctic pipe insulation. This is a jacketed, large diameter pipe. Ream bore hole, and provide pulling equipment to degree needed to install pipe without jacket damage.

AD2.07 331100- Water Distribution Piping

REPLACE Entirely with attached Specification

AD2.08 331613 - Potable Water Storage Tank

REPLACE Entirely with attached Specification

APPROVED PRODUCT SUBSTITUTIONS

AD2.09 The following product substitutions have been reviewed and approved by the Architect/Engineer for bidding purposes only with regards to section 133419 Metal Building Systems: The contract documents will be updated post-award, if necessary, to reflect the accepted products.

- Roof System:
 - Original Basis of Design: Metl-Span CFR Insulated Roof Panel
 - Approved Alternate: All Weather Insulated Panels (AWIP) SR2 Standing Seam Roof Panel
- Wall System:
 - Original Basis of Design: Metl-Span CF Mesa Insulated Wall Panel
 - Approved Alternate: All Weather Insulated Panels (AWIP) DM40 Mesa Wall Panel
- Submittal Requirements: Bidders shall include the approved AWIP products in their proposals and submit standard product data and shop drawings for review and approval during the submittal phase.

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- The Owner has not issued Division 01 Section 01 25 00 – Substitution Procedures. Therefore, this addendum serves as the formal approval of the listed product substitutions for bidding purposes. The Contractor shall include these products in their bid and submit standard product data and shop drawings for review and approval during the submittal phase. No further substitution request is required for these products.

Supporting data including product technical data, performance testing, and substitution request forms are attached to this addendum.

DRAWINGS**AD2.10 C-301 – PLAN AND PROFILE – OPHIR CREEK ROAD**

REPLACE Sheet entirely with Attached.

- Removed casing and adjusted limit of HDD

AD2.11 C-302– PLAN AND PROFILE – COAST GUARD ROAD (1 OF 2)

REPLACE Sheet entirely with Attached.

- Removed casing and adjusted limit of HDD

AD2.12 C-305– PLAN AND PROFILE – AIRPORT ROAD (2 OF 14)

REPLACE Sheet entirely with Attached.

- Removed casing and adjusted limit of HDD

AD2.13 C-306– PLAN AND PROFILE – AIRPORT ROAD (3 OF 14)

REPLACE Sheet entirely with Attached.

- Removed casing and adjusted limit of HDD

AD2.14 C-316– PLAN AND PROFILE – AIRPORT ROAD (13 OF 14)

REPLACE Sheet entirely with Attached.

- Removed casing and adjusted limit of HDD

AD2.15 C-317– PLAN AND PROFILE – AIRPORT ROAD (14 OF 14)

REPLACE Sheet entirely with Attached.

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- Removed casing and adjusted limit of HDD

AD2.16 C-318– PLAN AND PROFILE – AIRPORT AREA

REPLACE Sheet entirely with Attached.

- Revised casing to SDR11

AD2.17 C-319– PLAN AND PROFILE – ENDICOTT ROAD TO AIRPORT ACCESS ROAD

REPLACE Sheet entirely with Attached.

- Updated Note 2 stationing.
- Deleted an extra water service.
- Upsized recirculation line.

AD2.18 C-320– PLAN AND PROFILE – AIRPORT ROAD ACCESS ROAD

REPLACE Sheet entirely with Attached.

- Revised casings to SDR11
- Deleted extra water service

AD2.19 C-501- WATER PIPING DETAILS

REPLACE Sheet entirely with Attached.

- Revised DIP Recirculation line to 4"

AD2.20 C-701– WATER SERVICE SCHEDULE

REPLACE Sheet entirely with Attached.

- Deleted extra water service

QUESTIONS AND RESPONSES:

1. **Question:** SECTION 312000 EARTH MOVING Requires and Excavation and Trenching Plan be prepared by PE registered in State of Alaska. Per OSHA this PE requirement something only required for excavation in excess of 20' deep. Can this requirement be waived when considering excavation less the 20' bgs?

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Response: Excavation and Trenching Plan signed by a PE is not required. This submittal requirement has been removed from section 312000 Earth Moving.

2. **Question:** Shannon and Wilson DRAFT for CMMP sets out a list of requirements to move construction forward. However there are no bid items taking this work into consideration. How does the project expect to handle the costs for contaminated soil and water management? We typically see items allocated to these costs when bidding unit price work; IE “Analytical Testing per EA” “Disposal of Contaminated Soil per TON” “Provide GAC per LB” “Environmental Management Plan and Administration per LS”. Please advise.

Response: The Revised Final CMMP is being issued with this addendum. Pay Items have been added for Contaminated Soils Stockpile and Field Screening. Disposal of contaminated soils will be negotiated once the type of contamination and the location of disposal has been determined.

3. **Question:** How will the project Handle RCRA contaminated materials if encountered?

Response: The Engineer should be notified immediately and will take steps to determine the plan forward including coordination with ADEC and a potential change order.

4. **Question:** Item 312000-1 Item for Additional Excavation & Backfill is unclear does the cubic yardage account for the materials hauled off, hauled in, or both?, There is no Item for Surplus/Unusable Excavation Disposal or Select Material Type A. We recommend removing 312000-1 and Replacing with two items one for the Surplus/Unusable Excavation and another for Select Material Type A as a more fair means to handle export and import for project.

Response: Additional Excavation & Backfill accounts for the excavation and haul-off of unsuitable materials and the import and placement of suitable materials. This item will only be authorized if unsuitable materials are encountered during excavation.

5. **Question:** Will the project please add a pay Item for Rigid Insulation Board?

Response: The cost of Rigid Insulation shall be subsidiary to pump house or water main pay item.

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6. **Question:** Both the Pump House and Water Storage tank are lump sum items. Does this include the earthwork to accommodate the structures? The Septic System? The Fence, Etc?

Response: Yes. Those are all subsidiary to the pump house and water storage tank items as described in the Basis of Payment for 331100 and 331613.

7. **Question:** What percentage of the contract value does the general contractor have to perform with its own resources?

Response: There is no stipulation on percentage of contract value that must be performed by the general contractor. Contractors must show good faith effort for acquiring DBEs per the special conditions (SPC-11).

8. **Question:** What is the estimated cost of this project?

Response: The construction estimate will not be provided.

9. **Question:** Can I get a copy of the updated plan holder list?

Response: I have attached the current plan holders list. This will be posted with each addendum on the CBY website.

10. **Question:** Are union bids required for this project?

Response: Union Bids are not required.

11. **Question:** Section 099123, 3.05.C references, “for hollow metal exterior doors and frames see Division 09 Section Exterior Painting.” There is no exterior painting specification provided. Please provide.

Response: Section 099100 –Painting has been added with this addendum.

12. **Question:** Section 400520 Plant Pipe and Fittings does not specify a coating system and there is no Division 09 high performance coating specification. Is a high-performance coating piping coating required for the interior piping at the pump house?

Response: Section 099100 – Painting has been added.

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13. **Question:** Is there an option to be able to attend the Prebid conference via a remote platform?

Response: Yes. The link was provided on CBY website and emailed to those on the Plan Holder's list.

14. **Question:** In section 330523.13. HDD Part 3 – Execution 3.01 Installation of pipe, Paragraph A reads "A cone shall be fabricated and attached to the pulling head that will protect the leading edge of the arctic pipe insulation. This is a jacketed, large diameter pipe. Ream bore hole, and provide pulling equipment to degree needed to install pipe without jacket damage." This alludes to the HDPE pipe as Arctic pipe. I'm only seeing on the plans arctic pipe for the exposed pipe above ground. I do not see Arctic pipe listed under Part 2 Products. Is this pipe to be Arctic pipe or is this a misprint?

Response: That was a misprint. The specification has been updated with this addendum.

15. **Question:** Regarding the recirculation line the Proposed WM Schedule is alluding to the pipe type to be 3" DI Class 50 where there is 10" DIP. 3" Class 50 is not made. Class 54 is what is offered. Current supply of 3" DI across the country is not good as well. Also, a note regarding the 3" that will be through HDD casing is called out to be TR/Flex or equal per section 331100 Part 2 2.20 paragraph C. This is not offered in 3" size. Can this pipe be sized up to 4" or be HDPE pipe similar to the 3" recirculation type with the 10" HDPE?

Response: Thanks for pointing this out. We have updated the recirculation line that was previously shown as 3" DIP to 4" DIP. This change is reflected in this addendum.

16. **Question:** Water service schedule shows the service to AKDOT&PF SREB Maintenance as 3". Plan call out is for the service to be Detail 1/C509 and Detail 4/C510. These details reference for the services to be copper with flare service fittings. These fittings stop at 2" Also, there is no 2" meter referenced on plan sheet C510 in the meter schedule. Is the 3" size, correct?

Response: Detail C-510 has been updated to show appropriate meter for 3" service. The specification has been updated to support the larger service.

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17. **Question:** Plan sheet C320 indicates two services running to Lot 4 Block 4 “Yakutat Airport Plaza”. Service connection at STA 231+37 is called out. A Service line is indicated at STA 23+20 but no service connection is called out. Does this lot get two service runs?

Response: No. This has been corrected on C320 and C701 to remove the extra service.

18. **Question:** Section 331100 ‘Water Distribution Piping’ 3.11 paragraph B (page 834 of contract documents) Hydrostatic Test calls out testing per ANSI/AWWA C600, a ductile iron piping testing specification. No hydrostatic testing requirement for HDPE piping are called out. AWWA C906 allows for expansion during testing of HDPE piping, C600 does not.

Response: Specification has been updated to add ANSI/AWWA C906 in this addendum.

19. **Question:** Section 330523.13 HDD Drilling 2.02 paragraph B (page 822 of contract documents) states a Standard Dimension Ratio of 17 (typical working pressure 125 psi), and minimum working pressure or 200 PSI. All suppliers we have contacted have stated that only Standard Dimension Ratio 11 HDPE piping is available at 200 PSI working pressure. Confirm if lower working pressure is acceptable or if thicker SDR 11 piping is required. If SDR 11 is required, is smaller ID (vs SDR 17) as casing piping acceptable?

Response: The casings where we have HDPE piping have been removed and casings for DIP have been changed to SDR 11. This has been updated with this addendum.

20. **Question:** Section 331100 Water Distribution Piping 2.02 paragraph A (page 829 of contract documents) state the use of class 50 ductile iron piping for water distribution. The Municipality of Anchorage typically specs out class 50 piping for gravity sewer systems and class 52 for pressurized water systems. Confirm required piping thickness for ductile iron portions of water system.

Response: Class 50 is required for pressurized water for CBY.

21. **Question:** Under Article 2 – Attachments to the Bid of the Bid Form, letter F states, “Required Bidder Qualification Statement with supporting data.” Please specify what information the Owner is seeking from the bidder with this requirement (e.g., past performance, company background information, etc.).

Response: Item F has been removed with this addendum.

22. **Question:** Does this tank require an immersion heater?

Response: No.

23. **Question:** What is the anticipated catch point of the new ditch backslope?

Response: This will be provided in Addendum 3.

BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

City and Borough of Yakutat

ATTN: City Clerk

clerk@yakutatak.us

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
- E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

~~F. Required Bidder Qualification Statement with supporting data~~

ARTICLE 3—BASIS OF BID—UNIT PRICES**3.01 Unit Price Bids**

A. Bidder will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
015000-1	Traffic Control	Lump Sum	All Required		\$
017300-1	Mobilization	Lump Sum	All Required		\$
017300-2	Field Engineering	Lump Sum	All Required		\$
024119-1	Selective Demolition	Lump Sum	All Required		\$
310000-1	Temporary Erosion and Pollution Control	Lump Sum	All Required		\$
311000-1	Clearing and Grubbing	Lump Sum	All Required		\$
312000-1	Additional Excavation & Backfill	Cubic Yard	2,000		\$
312000-2	Gravel Road Resurfacing	Square Yard	1,940		\$
312000-3	Ditch Realignment	Linear Foot	13,550		\$
312000-4	Contaminated Soils Stockpile	Cubic Yard	940		\$
312119-1	Field Screening	Lump Sum	All Required		\$
312119-1	Dewatering	Lump Sum	All Required		\$
321216-1	3" Hot-Mix Asphalt	Ton	75		\$
321216-2	Driveway Asphalt	Square Yard	450		\$
329200-1	Topsoil	Square Yard	31,100		\$
329200-2	Seeding	Square Yard	31,100		\$
330523-1	Horizontal Directional Drilling (108" HDPE SDR17 SDR11)	Linear Foot	390		\$
330523-2	Horizontal Directional Drilling (12" HDPE SDR17 SDR11)	Linear Foot	300		\$
330523-3	Horizontal Directional Drilling (18" HDPE SDR17 SDR11)	Linear Foot	1,290 390		\$
331100-1	6" HDPE Water Main	Linear Foot	4,600		\$
331100-2	10" HDPE Water Main	Linear Foot	13,710		\$
331100-3	6" DIP Water Main	Linear Foot	1,160		\$
331100-4	10" DIP Water Main	Linear Foot	2,560		\$
331100-5	3" Recirculation Line	Linear Foot	16,270 13,740		\$
331100-6	Fire Hydrants	Each	31		\$
331100-7	6" Gate Valves	Each	15		\$
331100-8	10" Gate Valves	Each	30		\$
331100-9	Water Services	Each	16 15		\$
331100-10	Pump House	Lump Sum	All Required		\$
331100-11	4" Recirculation Line	Linear Foot	2600		\$
331613-1	500K Gallon Water Storage Tank	Lump Sum	All Required		\$
334100-1	18" Corrugated Steel Pipe	Linear Foot	120		\$
334100-2	18" Culvert End Section	Each	4		\$
334100-3	24" Corrugated Steel Pipe	Linear Foot	110		\$
334100-4	24" Culvert End Section	Each	4		\$
334100-5	36" Corrugated Steel Pipe	Linear Foot	60		\$
334100-6	36" Culvert End Section	Each	2		\$
334100-7	60" Corrugated Steel Pipe	Linear Foot	60		\$
334100-8	60" Culvert End Section	Each	2		\$

334100-9	Culvert Marker Post	Each	12		\$
334100-10	18" Corrugated Polyethylene Pipe	Linear Foot	80		\$
Total of All Unit Price Bid Items					\$

B. Bidder acknowledges that:

1. Each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
2. Estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 4—TIME OF COMPLETION

- 4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates indicated in the Agreement.

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda: **[Add rows as needed. Bidder is to complete table.]**

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

- A. In submitting this Bid, Bidder represents the following:
1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing

surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:

-
- a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
 - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

Address for giving notices:

Bidder's Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

Bidder's Contractor License No.: (if applicable)

MINIMUM RATES OF PAY

For Laborers and Mechanics

Effective Sept. 1, 2025

Issue 51

PAMPHLET No. 600

Title 36. Public Contracts
AS 36.05

DEPARTMENT OF LABOR
AND WORKFORCE DEVELOPMENT
Wage and Hour



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THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Labor and Workforce Development

Office of the Commissioner

Post Office Box 111149
Juneau, Alaska 99811
Main: 907.465.2700
fax: 907.465-2784

September 1, 2025

TO ALL CONTRACTING AGENCIES:

At the Alaska Department of Labor and Workforce Development our goal is putting Alaskans to work. This pamphlet is designed to help contractors awarded public construction contracts understand the most significant laws of the State of Alaska pertaining to prevailing wages.

This pamphlet identifies current prevailing wage rates for public construction contracts (any construction projects awarded for the State of Alaska or its political subdivisions, such as local governments and certain non-profit organizations). Because these rates may change in a subsequent determination, please be sure you are using the appropriate rates. The rates published in this edition become effective September 1, 2025.

The prevailing wage rates contained in this pamphlet are applicable to public construction projects with a final bid date of September 11, 2025, or later. As the law now provides, these rates will remain stable during the life of a contract or for 24 calendar months, whichever is shorter. **On the date the prime contract is awarded, the 24-month period begins.** Upon expiration of this period, the latest wage rates issued by the department shall become effective for a subsequent 24-month period or until the original contract is completed, whichever occurs first. This process shall be repeated until the original contract is completed.

The term "original contract" means the signed contract that resulted from the original bid and any amendments, including changes of work scope, additions, extensions, change orders, and other instruments agreed to by the parties that have not been subject to subsequent open bid procedures. If a higher federal rate is required due to partial federal funding or other federal participation, the higher rate must be paid.

Effective July 1, 2025, Alaska Statutes 23.10.066–23.10.069 (Alaska's Paid Sick Leave Requirements) take effect. Accordingly, for all projects bid after this date, contractors must comply with the paid sick leave provisions. When calculating the regular rate for sick time, contractors are required to include prevailing wages, specifically the base hourly rate (BHR), for all hours worked on site in accordance with the applicable pamphlet.

For additional copies of this pamphlet go to: <http://labor.state.ak.us/lss/pamp600.htm> and for questions regarding prevailing wage or employment preference requirements, please contact the nearest Wage and Hour office. These offices are listed on Page x.

Sincerely,

A handwritten signature in blue ink that reads "Catherine Muñoz".

Catherine Muñoz
Commissioner

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Wage Rates Pages 1-27

On the cover: Travis Jones fixes a tug luggage tractor, photo by Kim Unzicker

Note to Readers: The statutes and administrative regulations listed in this publication were taken from the official codes, as of the effective date of the publication. However, there may be errors or omissions that have not been identified and changes that occurred after the publication was printed. This publication is intended as an informational guide only and is not intended to serve as a precise statement of the statutes and regulations of the State of Alaska. To be certain of current laws and regulations, please refer to the official codes.

EXCERPTS FROM ALASKA LAW

Sec. 36.05.005. Applicability.

This chapter applies only to a public construction contract that exceeds \$25,000.

Sec. 36.05.010. Wage rates on public construction.

A contractor or subcontractor who performs work on a public construction contract in the state shall pay not less than the current prevailing rate of wages for work of a similar nature in the region in which the work is done. The current prevailing rate of wages is that contained in the latest determination of prevailing rate of wages issued by the Department of Labor and Workforce Development at least 10 days before the final date for submission of bids for the contract. The rate shall remain in effect for the life of the contract or for 24 calendar months, whichever is shorter. At the end of the initial 24-month period, if new wage determinations have been issued by the department, the latest wage determination shall become effective for the next 24-month period or until the contract is completed, whichever occurs first. This process shall be repeated until the contract is completed.

Sec. 36.05.040. Filing schedule of employees, wages paid, and other information.

All contractors or subcontractors who perform work on a public construction contract for the state or for a political subdivision of the state shall, before the Friday of every second week, file with the Department of Labor and Workforce Development a sworn affidavit for the previous reporting period, setting out in detail the number of persons employed, wages paid, job classification of each employee, hours worked each day and week, and other information on a form provided by the Department of Labor and Workforce Development.

Sec. 36.05.045. Notice of work and completion; withholding of payment.

- (a) Before commencing work on a public construction contract, the person entering into the contract with a contracting agency shall designate a primary contractor for purposes of this section. Before work commences, the primary contractor shall file a notice of work with the Department of Labor and Workforce Development. The notice of work must list work to be performed under the public construction contract by each contractor who will perform any portion of work on the contract and the contract price being paid to each contractor. The primary contractor shall pay all filing fees for each contractor performing work on the contract, including a filing fee based on the contract price being paid for work performed by the primary contractor's employees. The filing fee payable shall be the sum of all fees calculated for each contractor. The filing fee shall be one percent of each contractor's contract price. The total filing fee payable by the primary contractor under this subsection may not exceed \$5,000. In this subsection, "contractor" means an employer who is using employees to perform work on the public construction contract under the contract or a subcontract.
- (b) Upon completion of all work on the public construction contract, the primary contractor shall file with the Department of Labor and Workforce Development a notice of completion together with payment of any additional filing fees owed due to increased contract amounts. Within 30 days after the department's receipt of the primary contractor's notice of completion, the department shall inform the contracting agency of the amount, if any, to be withheld from the final payment.
- (c) A contracting agency
 - (1) may release final payment of a public construction contract to the extent that the agency has received verification from the Department of Labor and Workforce Development that
 - (A) the primary contractor has complied with (a) and (b) of this section;
 - (B) the Department of Labor and Workforce Development is not conducting an investigation under this title; and
 - (C) the Department of Labor and Workforce Development has not issued a notice of a violation of this chapter to the primary contractor or any other contractors working on the public construction contract; and

- (2) shall withhold from the final payment an amount sufficient to pay the department's estimate of what may be needed to compensate the employees of any contractors under investigation on this construction contract, and any unpaid filing fees.
- (d) The notice and filing fee required under (a) of this section may be filed after work has begun if
 - (1) The public construction contract is for work undertaken in immediate response to an emergency; and
 - (2) The notice and fees are filed not later than 14 days after the work has begun.
- (e) A false statement made on a notice required by this section is punishable under AS 11.56.210.

Sec. 36.05.060. Penalty for violation of this chapter.

A contractor who violates this chapter is guilty of a misdemeanor and upon conviction is punishable by a fine of not less than \$100 nor more than \$1,000, or by imprisonment for not less than 10 days nor more than 90 days, or by both. Each day a violation exists constitutes a separate offense.

Sec. 36.05.070. Wage rates in specifications and contracts for public works.

- (a) The advertised specifications for a public construction contract that requires or involves the employment of mechanics, laborers, or field surveyors must contain a provision stating the minimum wages to be paid various classes of laborers, mechanics, or field surveyors and that the rate of wages shall be adjusted to the wage rate under AS 36.05.010.
- (b) Repealed by §17 ch 142 SLA 1972.
- (c) A public construction contract under (a) of this section must contain provisions that
 - (1) the contractor or subcontractors of the contractor shall pay all employees unconditionally and not less than once a week;
 - (2) wages may not be less than those stated in the advertised specifications, regardless of the contractual relationship between the contractor or subcontractors and laborers, mechanics, or field surveyors;
 - (3) the scale of wages to be paid shall be posted by the contractor in a prominent and easily accessible place at the site of the work;
 - (4) the state or a political subdivision shall withhold so much of the accrued payments as is necessary to pay to laborers, mechanics, or field surveyors employed by the contractor or subcontractors the difference between
 - (A) the rates of wages required by the contract to be paid laborers, mechanics, or field surveyors on the work; and
 - (B) the rates of wages in fact received by laborers, mechanics, or field surveyors.

Sec. 36.05.080. Failure to pay agreed wages.

Every contract within the scope of AS 36.05.070 shall contain a provision that if it is found that a laborer, mechanic, or field surveyor employed by the contractor or subcontractor has been or is being paid a rate of wages less than the rate of wages required by the contract to be paid, the state or its political subdivision may, by written notice to the contractor, terminate the contractor's right to proceed with the work or the part of the work for which there is a failure to pay the required wages and to prosecute the work to completion by contract or otherwise, and the contractor and the contractor's sureties are liable to the state or its political subdivision for excess costs for completing the work.

Sec. 36.05.090. Payment of wages from withheld payments and listing contractors who violate contracts.

- (a) The state disbursing officer in the case of a state public construction contract and the local fiscal officer in the case of a political subdivision public construction contract shall pay directly to laborers, mechanics, or field surveyors from accrued payments withheld under the terms of the contract the wages due laborers, mechanics, or field surveyors under AS 36.05.070.
- (b) The state disbursing officer or the local fiscal officer shall distribute to all departments of the state government and to all political subdivisions of the state a list giving the names of persons who have disregarded their obligations to employees. A person appearing on this list and a firm, corporation, partnership, or association in which the person has an interest may not work as a contractor or

subcontractor on a public construction contract for the state or a political subdivision of the state until three years after the date of publication of the list. If the accrued payments withheld under the contract are insufficient to reimburse all the laborers, mechanics, or field surveyors with respect to whom there has been a failure to pay the wages required under AS 36.05.070, the laborers, mechanics, or field surveyors have the right of action or intervention or both against the contractor and the contractor's sureties conferred by law upon persons furnishing labor or materials, and in the proceedings it is not a defense that the laborers, mechanics, or field surveyors accepted or agreed to accept less than the required rate of wages or voluntarily made refunds.

Sec. 36.05.900. Definition.

In this chapter, "contracting agency" means the state or a political subdivision of the state that has entered into a public construction contract with a contractor.

EXCERPTS FROM ALASKA ADMINISTRATIVE CODE

*****Notice:** Regulations relating to board and lodging and per diem went into effect on November 25, 2018. The new regulations are excerpted here***

8 AAC 30.051. Purpose. The purpose of 8 AAC 30.052 – 8 AAC 30.056 is to ensure that wages paid to laborers, mechanics, and field surveyors do not fall below the prevailing rate of pay.

8 AAC 30.052. Board and lodging; remote sites. (a) A contractor on a public construction project located 65 or more road miles from the international airport closest to the project area in either Fairbanks, Juneau, or Anchorage, or that is inaccessible by road in a two-wheel drive vehicle, shall provide adequate board and lodging to each laborer, mechanic, or field surveyor while the person is employed on the project. If commercial lodging facilities are not available, the contractor shall provide temporary lodging facilities. Lodging facilities must comply with all applicable state and federal laws. For a highway project, the location of the project is measured from the midpoint of the project.

(b) A contractor is not required to provide board and lodging:

(1) to a laborer, mechanic, or field surveyor who is a domiciled resident of the project area; or

(2) on a laborer, mechanic, or field surveyor's scheduled days off, when the person can reasonably travel between the project and the person's permanent residence; for the purposes of this paragraph, "scheduled day off" means a day in which a person does not perform work on-site, is not required to remain at or near the job location for the benefit of the contractor, and is informed of the day off at least seven days before the day off.

(c) Upon a contractor's written request, the commissioner may waive the requirements of (a) of this section where:

(1) the project is inaccessible by road in a two-wheel drive vehicle, but the laborer, mechanic, or field surveyor can reasonably travel between the project and the person's permanent residence within one hour; or

(2) a laborer, mechanic, or field surveyor is not a domiciled resident of the project area, but has established permanent residence, with the intent to remain indefinitely, within 65 road miles of the project, or for a highway project, the mid-point of the project.

8 AAC 30.054. Per diem instead of board and lodging. (a) A contractor may pay a laborer, mechanic, or field surveyor per diem instead of providing board and lodging, when the following conditions are met:

(1) the department determines that per diem instead of board and lodging is an established practice for the work classification; the department shall publish and periodically revise its determinations in the pamphlet *Laborers and Mechanics Minimum Rates of Pay*;

(2) the contractor pays each laborer, mechanic, or field surveyor the appropriate per diem rate as published and periodically revised in the pamphlet *Laborers and Mechanics Minimum Rates of Pay*; and

(3) the contractor pays the per diem to each laborer, mechanic, or field surveyor on the same day that wages are paid.

(b) A contractor may not pay per diem instead of board and lodging on a highway project located

- (1) west of Livengood on the Elliot Highway, AK-2;
- (2) on the Dalton Highway, AK-11;
- (3) north of milepost 20 on the Taylor Highway, AK-5;
- (4) east of Chicken on the Top of the World Highway; or
- (5) south of Tetlin Junction to the Alaska-Canada border on the Alaska Highway, AK-2.

8 AAC 30.056. Alternative arrangement. Upon a contractor's written request, the commissioner may approve an alternative board and lodging or per diem arrangement, provided

- (1) the arrangement does not reduce the laborer, mechanic, or field surveyor's wages below the prevailing wage rate; and
- (2) the laborer, mechanic, or field surveyor voluntarily enters into and signs the written arrangement; a labor organization representing laborers, mechanics, or field surveyors may enter into the written agreement on their behalf.

8 AAC 30.900. General definitions (selected excerpts only):

In this chapter and in AS 36

(22) "domiciled resident" means a person living within 65 road miles of a public construction project, or in the case of a highway project, the mid-point of the project, for at least 12 consecutive months prior to the award of the public construction project;

(23) "employed on the project" means the time period from the date the laborer, mechanic, or field surveyor first reports on-site to the project through the final date the person reports on-site to the project.

ADDITIONAL INFORMATION

PER DIEM

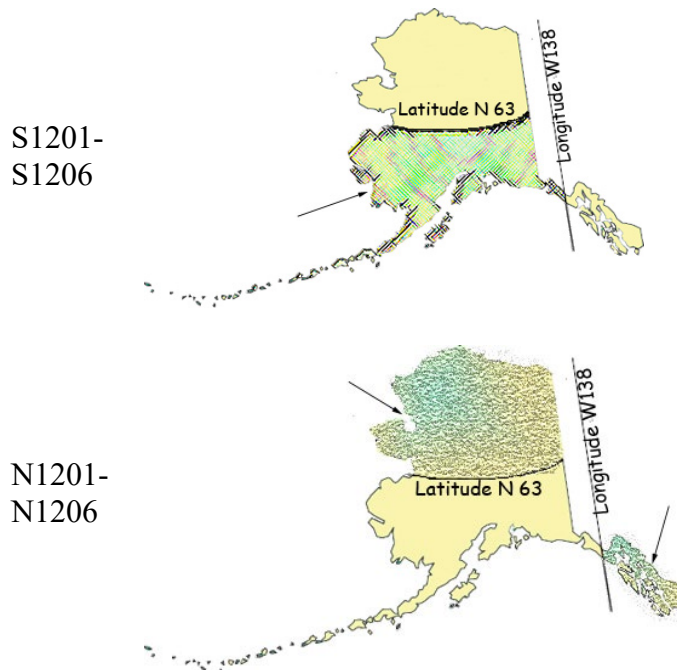
Notice: New regulations relating to board and lodging and per diem went into effect on November 25, 2018. The regulations provide a comprehensive set of requirements for the provision of board and lodging or per diem for workers on remote projects. Please refer to Alaska Administrative Code 8 AAC Chapter 30 and read the chapter carefully.

The Alaska Department of Labor and Workforce Development has determined that per diem is an established work practice for certain work classifications. These classifications are indicated throughout the Pamphlet by an asterisk (*) under the classification title. If all of the conditions of 8 AAC 30.054 are met, an employer may pay workers in these classifications per diem instead of providing board and lodging on a remote project.

Per Diem Rate: As of May 1, 2019, the minimum per diem rate is \$100.00 per day, or part thereof, the worker is employed on the project. In the event that a contractor provides lodging facilities, but no meals, the department will accept a payment of \$48 per day for meals to meet the per diem requirements.

LABORER CLASSIFICATION CLARIFICATION

The laborer rates categorized in class code S1201-S1206 apply in one area of Alaska; the area that is south of N63 latitude and west of W138 Longitude. The laborer rates categorized in class code N1201-N1206 apply in two areas of Alaska; the Alaska areas north of N63 latitude and east of W138 longitude. The following graphic representations should assist with clarifying the applicable wage rate categories:



APPRENTICE RATES

Apprentice rates at less than the minimum prevailing rates may be paid to apprentices according to an apprentice program which has been registered and approved by the Commissioner of the Alaska Department of Labor and Workforce Development in writing or according to a bona fide apprenticeship program registered with the U.S. Department of Labor, Office of Apprenticeship Training. **Any employee listed on a payroll at an apprentice wage rate who is not registered as above shall be paid the journeyman prevailing minimum wage in that work classification.** Wage rates are based on prevailing crew makeup practices in Alaska and apply to work performed regardless of either the quality of the work performed by the employee or the titles or classifications which may be assigned to individual employees.

FRINGE BENEFIT PLANS

Contractors/subcontractors may compensate fringe benefits to their employees in any one of three methods. The fringe benefits may be paid into a union trust fund, into an approved benefit plan, or paid directly on the paycheck as gross wages.

Where fringe benefits are paid into approved plans, funds, or programs including union trust funds, the payments must be contributed at least monthly. If contractors submit their own payroll forms and are paying fringe benefits into approved plans, funds, or programs, the employer's certification must include, in addition to those requirements of 8 AAC 30.020(c), a statement that fringe benefit payments have been or will be paid at least monthly. Contractors who pay fringe benefits to a plan must ensure the plan is one approved by the Internal Revenue Service and that the plan meets the requirements of 8 AAC 30.025 (eff. 3/2/08) in order for payments to be credited toward the prevailing wage obligation.

PAID SICK LEAVE

Effective July 1, 2025, the provisions of Alaska Statutes 23.10.066–23.10.069, relating to paid sick leave, shall apply. For all projects bid after July 1, 2025, contractors are required to comply with these statutory provisions. The regular rate of pay for sick leave must be calculated to include prevailing wages, defined as the base hourly rate (BHR), for all hours worked on site in accordance with the applicable pamphlet.

SPECIAL PREVAILING WAGE RATE DETERMINATION

Special prevailing wage rate determinations may be requested for special projects or a special worker classification if the work to be performed does not conform to traditional public construction for which a prevailing wage rate has been established under 8 AAC 30.050(a) of this section. Requests for special wage rate determinations must be in writing and filed with the Commissioner at least 30 days before the award of the contract. An applicant for a special wage rate determination shall have the responsibility to support the necessity for the special rate. An application for a special wage rate determination filed under this section must contain:

- (1) a specification of the contract or project on which the special rates will apply and a description of the work to be performed;
- (2) a brief narrative explaining why special wage rates are necessary;
- (3) the job class or classes involved;
- (4) the special wage rates the applicant is requesting, including survey or other relevant wage data to support the requested rates;
- (5) the approximate number of employees who would be affected; and
- (6) any other information which might be helpful in determining if special wage rates are appropriate.

Requests made pursuant to the above should be addressed to:

Director
Alaska Department of Labor and Workforce Development
Labor Standards and Safety Division
Wage and Hour
P.O. Box 111149
Juneau, AK 99811-1149
-or-
Email: statewide.wagehour@alaska.gov

EMPLOYMENT PREFERENCE INFORMATION

In October 2019, the Alaska Attorney General issued a formal opinion stating that the Alaska Statutes 36.10.150 of the State's 90% Employment Preference law, also known as the Alaska Resident Hire law, violates both the U.S. and Alaska Constitutions. As a result, the state has stopped all enforcement activity. A copy of the Attorney General opinion is found here:

http://law.alaska.gov/pdf/opinions/opinions_2019/19-005_AK-hire.pdf

Alaska Department of Labor and Workforce Development
Labor Standards and Safety Division
Wage and Hour
Web site: <http://labor.state.ak.us/lss/pamp600.htm>

Anchorage

1251 Muldoon Road, Suite 113
Anchorage, Alaska 99504-2098
Phone: (907) 269-4900

Email:
statewide.wagehour@alaska.gov

Juneau

PO Box 111149
Juneau, Alaska 99811
Phone: (907) 465-4842

Email:
statewide.wagehour@alaska.gov

Fairbanks

Regional State Office Building
675 7th Ave., Station J-1
Fairbanks, Alaska 99701-4593
Phone: (907) 451-2886

Email:
statewide.wagehour@alaska.gov

LABOR STANDARDS AND SAFETY NOTICE REQUESTS

If you would like to receive Wage and Hour or Mechanical Inspection **regulation notices** or **publications information**, they are available via electronic mail, by signing up in the GovDelivery System, <https://public.govdelivery.com/accounts/AKDOL/subscriber/new> and selecting topics *LSS – Wage and Hour – Forms and Publications*, *LSS – Mechanical Inspection Regulations*, or *LSS – Wage and Hour Regulations*.

Publications are also available online at <http://labor.alaska.gov/lss/home.htm>

DEBARMENT LIST

AS 36.05.090(b) states that “the state disbursing officer or the local fiscal officer shall distribute to all departments of the state government and to all political subdivisions of the state a list giving the names of persons who have disregarded their obligations to employees.”

A person appearing on the following debarment list and a firm, corporation, partnership, or association in which the person has an interest may not work as a contractor or subcontractor on a public construction contract for the state or a political subdivision of the state for three years from the date of debarment.

Company Name

Debarment Expires

No companies are currently debarred.

Laborers' & Mechanics' Minimum Rates of Pay

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Boilermakers

*See per diem note on last page

						VAC	SAF	
A0101	Boilermaker (journeyman)	54.08	8.57	18.72	2.50	4.25	0.34	88.46

Bricklayers & Allied Craftworkers

*See per diem note on last page

						L&M	ANU	
A0201	Blocklayer, including:	52.77		9.91	0.66	0.20	2.45	65.99

Bricklayer

Marble Mason

Refractory Worker (Firebrick, Plastic, Castable, and Gunitite Refractory Applications)

Stone Mason

Terrazzo Worker

Tile Setter

						L&M	ANU	
A0202	Pointer/Caulker/Cleaner (PCC)	52.77		9.91	0.66	0.20	2.45	65.99

Caulker

Cleaner

Tuck Pointer

						L&M	ANU	
A0203	Finisher	40.91		10.03	0.54	0.20	2.45	54.13

Marble Finisher

Terrazzo Finisher

Tile Finisher

						L&M	ANU	
A0204	Torginal Applicator	40.91		10.03	0.54	0.20	2.45	54.13

Carpenters, Region I (North of 63 latitude)

*See per diem note on last page

						L&M	SAF	
N0301	Carpenter (journeyman)	50.79	8.75	16.80	0.77	0.10		77.21

Lather/Drywall/Acoustical

Carpenters, Region II (South of N63 latitude)

*See per diem note on last page

						L&M	SAF	
S0301	Carpenter (journeyman)	50.79	8.75	17.34	0.77	0.10		77.75

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Carpenters, Region II (South of N63 latitude)								
*See per diem note on last page								
S0301	Carpenter (journeyman)	50.79	8.75	17.34	0.77		L&M 0.10	SAF 77.75
	Lather/Drywall/Acoustical							
Cement Masons								
*See per diem note on last page								
A0401	Group I, including:	49.28	8.80	11.80	1.68		L&M 0.10	71.66
	Application of Sealing Compound							
	Application of Underlayment							
	Building, General							
	Cement Finisher							
	Cement Mason (journeyman)							
	Concrete							
	Concrete Paving							
	Concrete Polishing							
	Concrete Repair							
	Curb & Gutter, Sidewalk							
	Curing of All Concrete							
	General Concrete Pour Tender							
	Grouting & Caulking of Tilt-Up Panels							
	Grouting of All Plates							
	Patching Concrete							
	Screed Pin Setter							
	Screeder or Rodder							
	Spackling/Skim Coating							
A0402	Group II, including:	49.28	8.80	11.80	1.68		L&M 0.10	71.66
	Form Setter							
A0403	Group III, including:	49.28	8.80	11.80	1.68		L&M 0.10	71.66
	Concrete Saw Cutter Operator (All Control Joints and Self-powered)							
	Curb & Gutter Machine							
	Floor Grinder							
	Pneumatic Power Tools							
	Power Chipping & Bushing							
	Sand Blasting Architectural Finish							
	Screed & Rodding Machine Operator							
	Troweling Machine Operator (all concrete surfaces)							
A0404	Group IV, including:	49.28	8.80	11.80	1.68		L&M 0.10	71.66

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Cement Masons

*See per diem note on last page

							L&M	
A0404	Group IV, including:	49.28	8.80	11.80	1.68	0.10		71.66
	Acoustical or Imitation Acoustical Finish							
	Application of All Composition Mastic							
	Application of All Epoxy Finishes on Concrete Surfaces							
	Application of All Plastic Material							
	Finish Colored Concrete							
	Guniting Nozzleman							
	Hand Powered Grinder							
	Preparing, scratching and browsing of all ceilings and walls, finished with terrazzo or tile							
	Tunnel Worker							

							L&M	
A0405	Group V, including:	49.28	8.80	11.80	1.68	0.10		71.66
	Casting and finishing							
	EIFS Systems							
	Finishing of all interior and exterior plastering							
	Fireproofing (Pryocrete, Cafco, Albi-Clad, sprayed fiberglass)							
	Gypsum, Portland Cement							
	Kindred material and products							
	Operation and control of all types of plastering machines, including power tools and floats, used by the industry							
	Overcoating and maintenance of interior/exterior plaster surfaces							
	Plasterer							
	Support and control of all concrete 3D printing operations (Excluding Paint)							
	Use of 3D structural and architectural printing and finishes							
	Use of sustainable materials and equipment practices							
	Veneer plastering process (Rapid Plaster, U.S.G. "Imperial Systems", and Pabcoat Systems")							
	Venetian plaster and color-integrated Italian/Middle-Eastern line plaster							

Culinary Workers

							LEG	
A0501	Baker/Cook	32.15	6.77	9.23				48.15
							LEG	
A0503	General Helper	28.23	6.77	9.23				44.23
	Housekeeper							
	Janitor							
	Kitchen Helper							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Culinary Workers							
A0504	Head Cook	32.15	6.77	9.23		LEG	48.15
A0505	Head Housekeeper	28.23	6.77	9.23		LEG	44.23
	Head Kitchen Help						
Dredgemen *See per diem note on last page							
A0601	Assistant Engineer	52.32	12.10	16.25	1.05	L&M 0.10	81.82
	Craneman						
	Electrical Generator Operator (primary pump/power barge/dredge)						
	Engineer						
	Welder						
A0602	Assistant Mate (deckhand)	50.93	12.10	16.25	1.05	L&M 0.10	80.43
A0603	Fireman	51.46	12.10	16.25	1.05	L&M 0.10	80.96
A0605	Leverman Clamshell	55.33	12.10	16.25	1.05	L&M 0.10	84.83
A0606	Leverman Hydraulic	53.23	12.10	16.25	1.05	L&M 0.10	82.73
A0607	Mate & Boatman	52.32	12.10	16.25	1.05	L&M 0.10	81.82
A0608	Oiler (dredge)	51.46	12.10	16.25	1.05	L&M 0.10	80.96
Electricians *See per diem note on last page							
A0701	Inside Cable Splicer	55.44	14.83	14.49	0.95	L&M 0.25 LEG 0.15	86.11
A0702	Inside Journeyman Wireman, including:	55.44	14.83	14.49	0.95	L&M 0.25 LEG 0.15	86.11
	Technicians (including use of drones in electrical construction)						
A0703	Power Cable Splicer	74.34	14.83	19.92	0.95	L&M 0.25 LEG 0.15	110.44
A0704	Tele Com Cable Splicer	55.28	14.83	18.56	0.95	L&M 0.25 LEG 0.15	90.02

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Electricians								
*See per diem note on last page								
A0705	Power Journeyman Lineman, including:	72.59	14.83	19.87	0.95	L&M	LEG	
	Power Equipment Operator					0.25	0.15	108.64
	Technician (including use of drones in electrical construction)							
A0706	Tele Com Journeyman Lineman, including:	53.53	14.83	18.51	0.95	L&M	LEG	
	Technician (including use of drones in telecommunications construction)					0.25	0.15	88.22
	Tele Com Equipment Operator							
A0707	Straight Line Installer - Repairman	53.53	14.83	18.51	0.95	L&M	LEG	
						0.25	0.15	88.22
A0708	Powderman	70.59	14.83	19.81	0.95	L&M	LEG	
						0.25	0.15	106.58
A0710	Material Handler	29.57	15.34	5.89	0.15	L&M	LEG	
						0.15	0.15	51.25
A0712	Tree Trimmer Groundman	32.97	14.83	14.84	0.15	L&M	LEG	
						0.15	0.15	63.09
A0713	Journeyman Tree Trimmer	42.23	14.83	15.12	0.15	L&M	LEG	
						0.15	0.15	72.63
A0714	Vegetation Control Sprayer	45.91	14.83	15.23	0.15	L&M	LEG	
						0.15	0.15	76.42
A0715	Inside Journeyman Communications CO/PBX	55.44	14.83	14.49	0.95	L&M	LEG	
						0.25	0.15	86.11
Elevator Workers								
*See per diem note on last page								
A0802	Elevator Constructor	50.01	16.28	21.36	0.80	L&M	VAC	
						1.60	5.55	95.60
A0803	Elevator Constructor Mechanic	71.44	16.28	21.36	0.80	L&M	VAC	
						1.60	7.93	119.41
Heat & Frost Insulators/Asbestos Workers (North of 63rd Parallel)								
*See per diem note on last page								
N0902	Asbestos Abatement-Mechanical Systems	46.35	9.24	11.13	1.50	IAF	LML	
						0.18	0.05	68.45
N0904	Insulator, Group II	46.35	9.24	11.13	1.50	IAF	LML	
						0.18	0.05	68.45
N0905	Fire Stop	46.35	9.24	11.13	1.50	IAF	LML	
						0.18	0.05	68.45
Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation								

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Heat & Frost Insulators/Asbestos Workers (South of 63rd Parallel)								
*See per diem note on last page								
						IAF	LML	
S0902	Asbestos Abatement-Mechanical Systems	45.85	9.24	11.13	1.50	0.18	0.05	67.95
						IAF	LML	
S0904	Insulator, Group II	45.85	9.24	11.13	1.50	0.18	0.05	67.95
						IAF	LML	
S0905	Fire Stop	45.85	9.24	11.13	1.50	0.18	0.05	67.95
IronWorkers								
*See per diem note on last page								
						L&M	IAF	
A1101	Ironworkers, including:	48.48	10.41	26.45	1.12	0.20		86.66
	Bender Operators							
	Bridge & Structural							
	Hangar Doors							
	Hollow Metal Doors							
	Industrial Doors							
	Machinery Mover							
	Mass Timber Construction (Cross Laminate Timber)							
	Ornamental							
	Reinforcing							
	Rigger							
	Sheeter							
	Signalman							
	Stage Rigger							
	Toxic Haz-Mat Work							
	Welder							
						L&M	IAF	
A1102	Helicopter	49.48	10.41	26.45	1.12	0.20		87.66
	Helicopter (used for rigging and setting)							
	Tower (energy producing windmill type towers to include nacelle and blades)							
						L&M	IAF	
A1103	Fence/Barrier Installer	44.98	10.41	26.45	1.12	0.20		83.16
						L&M	IAF	
A1104	Guard Rail Layout Man	45.72	10.41	26.45	1.12	0.20		83.90
						L&M	IAF	
A1105	Guard Rail Installer	45.98	10.41	26.45	1.12	0.20		84.16
Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)								
*See per diem note on last page								

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

						L&M	LEG	
N1201	Group I, including:	40.25	10.55	21.51	2.00	0.35	0.20	74.86
	Asphalt Worker (shovelman, plant crew)							
	Brush Cutter							
	Camp Maintenance Laborer							
	Carpenter Tender or Helper							
	Choke Setter, Hook Tender, Rigger, Signalman							
	Concrete Labor (curb & gutter, chute handler, curing, grouting, screeding)							
	Crusher Plant Laborer							
	Demolition Laborer							
	Ditch Digger							
	Dumpman							
	Environmental Laborer (hazard/toxic waste, oil spill)							
	Fence Installer							
	Fire Watch Laborer							
	Flagman							
	Form Stripper							
	General Laborer							
	Guardrail Laborer, Bridge Rail Installer							
	Hydro Seeder Nozzleman							
	Laborer, Building							
	Landscaper or Planter							
	Laying of Mortarless Decorative Block (retaining walls, flowered decorative block 4 feet or less - highway or landscape work)							
	Material Handler							
	Pneumatic or Power Tools							
	Portable or Chemical Toilet Serviceman							
	Pump Man or Mixer Man							
	Railroad Track Laborer							
	Sandblast, Pot Tender							
	Saw Tender							
	Slurry Work							
	Steam Cleaner Operator							
	Steam Point or Water Jet Operator							
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)							
	Tank Cleaning							
	Utiliwalk & Utilidor Laborer							
	Watchman (construction projects)							
	Window Cleaner							

						L&M	LEG	
N1202	Group II, including:	41.25	10.55	21.51	2.00	0.35	0.20	75.86

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

						L&M	LEG	
N1202	Group II, including:	41.25	10.55	21.51	2.00	0.35	0.20	75.86

Burning & Cutting Torch
 Cement or Lime Dumper or Handler (sack or bulk)
 Certified Erosion Sediment Control Lead (CESCL Laborer)
 Choker Splicer
 Chucktender (wagon, air-track & hydraulic drills)
 Concrete Laborer (power buggy, concrete saws, pumpcrete nozzleman, vibratorman)
 Culvert Pipe Laborer
 Cured Inplace Pipelayer
 Environmental Laborer (asbestos, marine work)
 Floor Preparation, Core Drilling
 Foam Gun or Foam Machine Operator
 Green Cutter (dam work)
 Guniting Operator
 Hod Carrier
 Jackhammer/Chipping Gun or Pavement Breaker
 Laser Instrument Operator
 Laying of Mortarless Decorative Block (retaining walls, flowered decorative block over 4 feet - highway or landscape work)
 Mason Tender & Mud Mixer (sewer work)
 Pilot Car
 Pipelayer Helper
 Plasterer, Bricklayer & Cement Finisher Tender
 Powderman Helper
 Power Saw Operator
 Railroad Switch Layout Laborer
 Sandblaster
 Scaffold Building & Erecting
 Sewer Caulker
 Sewer Plant Maintenance Man
 Thermal Plastic Applicator
 Timber Faller, Chainsaw Operator, Filer
 Timberman

						L&M	LEG	
N1203	Group III, including:	42.15	10.55	21.51	2.00	0.35	0.20	76.76

Bit Grinder
 Camera/Tool/Video Operator
 Guardrail Machine Operator
 High Rigger & Tree Topper
 High Scaler
 Multiplate

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

						L&M	LEG	
N1203	Group III, including:	42.15	10.55	21.51	2.00	0.35	0.20	76.76

Plastic Welding
Slurry Seal Squeegee Man
Traffic Control Supervisor
Welding Certified (in connection with laborer's work)

						L&M	LEG	
N1204	Group IIIA	46.53	10.55	21.51	2.00	0.35	0.20	81.14

Asphalt Raker, Asphalt Belly Dump Lay Down
Drill Doctor (in the field)
Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)
Pioneer Drilling & Drilling Off Tugger (all type drills)
Pipelayers
Powderman (Employee Possessor)
Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)
Traffic Control Supervisor, DOT Qualified

						L&M	LEG	
N1205	Group IV	29.82	10.55	21.51	2.00	0.35	0.20	64.43

Final Building Cleanup
Permanent Yard Worker

						L&M	LEG	
N1206	Group IIIB	54.01	5.50	21.51	1.60	0.35	0.20	83.17

Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)
Federal Powderman (Responsible Person in Charge)
Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)
Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)
Stake Hopper

Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

						L&M	LEG	
S1201	Group I, including:	40.25	10.55	21.51	2.00	0.35	0.20	74.86

Asphalt Worker (shovelman, plant crew)
Brush Cutter
Camp Maintenance Laborer
Carpenter Tender or Helper
Choke Setter, Hook Tender, Rigger, Signalman
Concrete Labor (curb & gutter, chute handler, curing, grouting, screeding)

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

						L&M	LEG	
S1201	Group I, including:	40.25	10.55	21.51	2.00	0.35	0.20	74.86

Crusher Plant Laborer
Demolition Laborer
Ditch Digger
Dumpman
Environmental Laborer (hazard/toxic waste, oil spill)
Fence Installer
Fire Watch Laborer
Flagman
Form Stripper
General Laborer
Guardrail Laborer, Bridge Rail Installer
Hydro Seeder Nozzleman
Laborer, Building
Landscape or Planter
Laying of Mortarless Decorative Block (retaining walls, flowered decorative block 4 feet or less - highway or landscape work)
Material Handler
Pneumatic or Power Tools
Portable or Chemical Toilet Serviceman
Pump Man or Mixer Man
Railroad Track Laborer
Sandblast, Pot Tender
Saw Tender
Slurry Work
Steam Cleaner Operator
Steam Point or Water Jet Operator
Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)
Tank Cleaning
Utiliwalk & Utilidor Laborer
Watchman (construction projects)
Window Cleaner

						L&M	LEG	
S1202	Group II, including:	41.25	10.55	21.51	2.00	0.35	0.20	75.86

Burning & Cutting Torch
Cement or Lime Dumper or Handler (sack or bulk)
Certified Erosion Sediment Control Lead (CESCL Laborer)
Choker Splicer
Chucktender (wagon, air-track & hydraulic drills)
Concrete Laborer (power buggy, concrete saws, pumpcrete nozzleman, vibratorman)

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Laborers (The area that is south of N63 latitude and west of W138 longitude)								
*See per diem note on last page								
							L&M	LEG
S1202	Group II, including:	41.25	10.55	21.51	2.00	0.35	0.20	75.86
	Culvert Pipe Laborer							
	Cured Inplace Pipelayer							
	Environmental Laborer (asbestos, marine work)							
	Floor Preparation, Core Drilling							
	Foam Gun or Foam Machine Operator							
	Green Cutter (dam work)							
	Gunite Operator							
	Hod Carrier							
	Jackhammer/Chipping Gun or Pavement Breaker							
	Laser Instrument Operator							
	Laying of Mortarless Decorative Block (retaining walls, flowered decorative block over 4 feet - highway or landscape work)							
	Mason Tender & Mud Mixer (sewer work)							
	Pilot Car							
	Pipelayer Helper							
	Plasterer, Bricklayer & Cement Finisher Tender							
	Powderman Helper							
	Power Saw Operator							
	Railroad Switch Layout Laborer							
	Sandblaster							
	Scaffold Building & Erecting							
	Sewer Caulker							
	Sewer Plant Maintenance Man							
	Thermal Plastic Applicator							
	Timber Faller, Chainsaw Operator, Filer							
	Timberman							
							L&M	LEG
S1203	Group III, including:	42.15	10.55	21.51	2.00	0.35	0.20	76.76
	Bit Grinder							
	Camera/Tool/Video Operator							
	Guardrail Machine Operator							
	High Rigger & Tree Topper							
	High Scaler							
	Multiplate							
	Plastic Welding							
	Slurry Seal Squeegee Man							
	Traffic Control Supervisor							
	Welding Certified (in connection with laborer's work)							
							L&M	LEG
S1204	Group IIIA	46.53	10.55	21.51	2.00	0.35	0.20	81.14

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

						L&M	LEG	
S1204	Group IIIA	46.53	10.55	21.51	2.00	0.35	0.20	81.14

Asphalt Raker, Asphalt Belly Dump Lay Down
Drill Doctor (in the field)
Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)
Pioneer Drilling & Drilling Off Tugger (all type drills)
Pipelayers
Powderman (Employee Possessor)
Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)
Traffic Control Supervisor, DOT Qualified

						L&M	LEG	
S1205	Group IV	29.82	10.55	21.51	2.00	0.35	0.20	64.43

Final Building Cleanup
Permanent Yard Worker

						L&M	LEG	
S1206	Group IIIB	54.01	5.50	21.51	1.60	0.35	0.20	83.17

Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)
Federal Powderman (Responsible Person in Charge)
Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)
Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)
Stake Hopper

Millwrights

*See per diem note on last page

						L&M		
A1251	Millwright (journeyman)	62.50	9.50	11.41	1.17	0.15	0.25	84.98

						L&M		
A1252	Millwright Welder	63.50	9.50	11.41	1.17	0.15	0.25	85.98

Painters, Region I (North of N63 latitude)

*See per diem note on last page

						L&M		
N1301	Group I, including:	43.05	10.15	15.20	1.10	0.10		69.60

Brush
General Painter
Hand Taping
Hazardous Material Handler
Lead-Based Paint Abatement

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Painters, Region I (North of N63 latitude)								
*See per diem note on last page								
		L&M						
N1301	Group I, including:	43.05	10.15	15.20	1.10	0.10		69.60
	Roll							
		L&M						
N1302	Group II, including:	43.57	10.15	15.20	1.10	0.10		70.12
	Bridge Painter							
	Epoxy Applicator							
	General Drywall Finisher							
	Hand/Spray Texturing							
	Industrial Coatings Specialist							
	Machine/Automatic Taping							
	Pot Tender							
	Sandblasting							
	Specialty Painter							
	Spray							
	Structural Steel Painter							
	Wallpaper/Vinyl Hanger							
N1304	Group IV, including:	46.76	10.15	19.21	1.10	0.10		77.32
	Glazier							
	Storefront/Automatic Door Mechanic							
N1305	Group V, including:	39.48	10.15	5.00	1.10	0.10		55.83
	Carpet Installer							
	Floor Coverer							
	Heat Weld/Cove Base							
	Linoleum/Soft Tile Installer							
N1306	Group VI, including:	69.78	11.21	10.49	1.00	0.10		92.58
	Traffic Control Striper							
Painters, Region II (South of N63 latitude)								
*See per diem note on last page								
		L&M						
S1301	Group I, including :	37.29	10.15	18.95	1.10	0.10		67.59
	Brush							
	General Painter							
	Hand Taping							
	Hazardous Material Handler							
	Lead-Based Paint Abatement							
	Roll							
Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation								

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Painters, Region II (South of N63 latitude)								
*See per diem note on last page								
							L&M	
S1301	Group I, including :	37.29	10.15	18.95	1.10	0.10		67.59
Spray								
							L&M	
S1302	Group II, including :	38.54	10.15	18.95	1.10	0.10		68.84
General Drywall Finisher								
Hand/Spray Texturing								
Machine/Automatic Taping								
Wallpaper/Vinyl Hanger								
							L&M	
S1303	Group III, including :	38.64	10.15	18.95	1.10	0.10		68.94
Bridge Painter								
Epoxy Applicator								
Industrial Coatings Specialist								
Pot Tender								
Sandblasting								
Specialty Painter								
Structural Steel Painter								
							L&M	
S1304	Group IV, including:	47.42	10.15	17.85	1.10	0.10		76.62
Glazier								
Storefront/Automatic Door Mechanic								
							L&M	
S1305	Group V, including:	39.48	10.15	5.00	1.10	0.10		55.83
Carpet Installer								
Floor Coverer								
Heat Weld/Cove Base								
Linoleum/Soft Tile Installer								
S1306	Group VI, including:	69.78	11.21	10.49	1.00	0.10		92.58
Traffic Control Striper								
Piledrivers								
*See per diem note on last page								
							L&M	IAF
A1401	Piledriver	50.79	8.75	16.80	0.77	0.10		77.21
Assistant Dive Tender								
Carpenter/Piledriver								
Rigger								
Sheet Stabber								

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Piledrivers								
*See per diem note on last page								
A1401	Piledriver	50.79	8.75	16.80	0.77	L&M	IAF	77.21
	Skiff Operator							
A1402	Piledriver-Welder/Toxic Worker	51.79	8.75	16.80	0.77	L&M	IAF	78.21
A1403	Remotely Operated Vehicle Pilot/Technician	55.10	8.75	16.80	0.77	L&M	IAF	81.52
	Single Atmosphere Suit, Bell or Submersible Pilot							
A1404	Diver (working) **See note on last page	94.90	8.75	16.80	0.77	L&M	IAF	121.32
A1405	Diver (standby) **See note on last page	55.10	8.75	16.80	0.77	L&M	IAF	81.52
A1406	Dive Tender **See note on last page	54.10	8.75	16.80	0.77	L&M	IAF	80.52
A1407	Welder (American Welding Society, Certified Welding Inspector)	56.35	8.75	16.80	0.77	L&M	IAF	82.77
Plumbers, Region I (North of N63 latitude)								
*See per diem note on last page								
N1501	Journeyman Pipefitter	55.66	12.95	20.20	1.75	L&M	S&L	91.76
	Plumber							
	Welder							
Plumbers, Region II (South of N63 latitude)								
*See per diem note on last page								
S1501	Journeyman Pipefitter	50.00	14.28	16.52	2.40	L&M		83.40
	Plumber							
	Welder							
Plumbers, Region IIA (1st Judicial District)								
*See per diem note on last page								
X1501	Journeyman Pipefitter	53.00	16.17	12.50	3.10	L&M		85.01
	Plumber							
	Welder							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Power Equipment Operators

*See per diem note on last page

							L&M	
A1601	Group I, including:	53.23	12.10	16.25	1.05	0.10		82.73
	Asphalt Roller: Breakdown, Intermediate, and Finish							
	Back Filler							
	Barrier Machine (Zipper)							
	Beltcrete with Power Pack & similar conveyors							
	Bending Machine							
	Boat Coxswain							
	Bulldozer							
	Cableways, Highlines & Cablecars							
	Cleaning Machine							
	Coating Machine							
	Concrete Hydro Blaster							
	Cranes (45 tons & under or 150 feet of boom & under (including jib & attachments))							
	(a) Hydralifts or Transporters, (all track or truck type)							
	(b) Derricks							
	(c) Overhead							
	Crushers							
	Deck Winches, Double Drum							
	Ditching or Trenching Machine (16 inch or over)							
	Drag Scraper, Yarder, and similar types							
	Drilling Machines, Core, Cable, Rotary and Exploration							
	Finishing Machine Operator, Concrete Paving, Laser Screed, Sidewalk, Curb & Gutter Machine							
	Grade Checker and/or Line and Grade including Drone							
	Helicopters							
	Hover Craft, Flex Craft, Loadmaster, Air Cushion, All-Terrain Vehicle, Rollagon, Bargecable, Nodwell, & Snow Cat							
	Hydro Ax, Feller Buncher & similar							
	Hydro Excavation (Vac-Truck and Similar)							
	Loaders (2 1/2 yards through 5 yards, including all attachments):							
	(a) Forklifts (with telescopic boom & swing attachment)							
	(b) Front End & Overhead, (2-1/2 yards through 5 yards)							
	(c) Loaders, (with forks or pipe clamp)							
	(d) Loaders, (elevating belt type, Euclid & similar types)							
	Material Transfer Vehicle (Elevating Grader, Pickup Machine, and similar types)							
	Mechanic, Welder, Bodyman, Electrical, Camp & Maintenance Engineer							
	Micro Tunneling Machine							
	Mixers: Mobile type with hoist combination							
	Motor Patrol Grader							
	Mucking Machine: Mole, Tunnel Drill, Horizontal/Directional Drill Operator and/or Shield							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Power Equipment Operators

*See per diem note on last page

							L&M	
A1601	Group I, including:	53.23	12.10	16.25	1.05	0.10		82.73

Off-Road Hauler (including Articulating and Haul Trucks)
 Operator on Dredges
 Piledriver Engineer, L.B. Foster, Puller or similar paving breaker
 Plant Operator (Asphalt & Concrete)
 Power Plant, Turbine Operator 200 k.w. & over (power plants or combination of power units over 300 k.w.)
 Remote Controlled Equipment
 Scraper (through 40 yards)
 Service Oiler/Service Engineer
 Shot Blast Machine
 Shovels, Backhoes, Excavators with all attachments, and Gradealls (3 yards & under)
 Sideboom (under 45 tons)
 Sub Grader (Gurries & similar types)
 Tack Tractor
 Truck Mounted Concrete Pump, Conveyor/Tele-belt, & Creter
 Wate Kote Machine

							L&M	
A1602	Group IA, including:	55.33	12.10	16.25	1.05	0.10		84.83

Camera/Tool/Video Operator (Slipline)
 Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic (over 10,000 hours)
 Cranes (over 45 tons or 150 feet including jib & attachments)
 (a) Clamshells & Draglines (over 3 yards)
 (b) Tower Cranes
 Licensed Water/Waste Water Treatment Operator
 Loaders (over 5 yards)
 Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt)
 Power Plants (1000 k.w. & over)
 Profiler, Reclaimer, and Roto-Mill
 Quad
 Scrapers (over 40 yards)
 Screed
 Shovels, Backhoes, Excavators with all attachments (over 3 yards)
 Sidebooms (over 45 tons)
 Slip Form Paver, C.M.I. & similar types
 Topside (Asphalt Paver, Slurry machine, Spreaders, and similar types)

							L&M	
A1603	Group II, including:	52.32	12.10	16.25	1.05	0.10		81.82

Boiler - Fireman

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Power Equipment Operators

*See per diem note on last page

							L&M	
A1603	Group II, including:	52.32	12.10	16.25	1.05	0.10		81.82

Cement Hogs & Concrete Pump Operator
 Conveyors (except those listed in Group I)
 Hoists on Steel Erection, Towermobiles & Air Tuggers
 Horizontal/Directional Drill Locator
 Locomotives, Rod & Geared Engines
 Mixers
 Screening, Washing Plant
 Sideboom (cradling rock drill, regardless of size)
 Skidder
 Trenching Machines (under 16 inches)
 Water/Waste Water Treatment Operator

							L&M	
A1604	Group III, including:	51.46	12.10	16.25	1.05	0.10		80.96

"A" Frame Trucks, Deck Winches
 Bombardier (tack or tow rig)
 Boring Machine
 Brooms, Power (sweeper, elevator, vacuum, or similar)
 Bump Cutter
 Compressor
 Farm Tractor
 Forklift, Industrial Type
 Gin Truck or Winch Truck (with poles when used for hoisting)
 Hoists, Air Tuggers, Elevators
 Loaders:
 (a) Elevating-Athey, Barber Greene & similar types
 (b) Forklifts or Lumber Carrier (on construction job sites)
 (c) Forklifts, (with tower)
 (d) Overhead & Front End, (under 2-1/2 yards)
 Locomotives: Dinkey (air, steam, gas & electric) Speeders
 Mechanics, Light Duty
 Oil, Blower Distribution
 Posthole Digger, Mechanical
 Pot Fireman (power agitated)
 Power Plant, Turbine Operator, (under 200 k.w.)
 Pumps, Water
 Roller (other than Asphalt)
 Saws, Concrete
 Skid Hustler
 Skid Steer (with all attachments)
 Stake Hopper

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Power Equipment Operators								
*See per diem note on last page								
							L&M	
A1604	Group III, including:	51.46	12.10	16.25	1.05	0.10		80.96
	Straightening Machine							
	Tow Tractor							
							L&M	
A1605	Group IV, including:	44.06	12.10	16.25	1.05	0.10		73.56
	Crane Assistant Engineer/Rig Oiler							
	Drill Helper							
	Parts & Equipment Coordinator							
	Spotter							
	Steam Cleaner							
	Swamper (on trenching machines or shovel type equipment)							
Roofers								
*See per diem note on last page								
							L&M	
A1701	Roofer & Waterproofer	52.07	13.90	4.01	0.81	0.10	0.09	70.98
							L&M	
A1702	Roofer Material Handler	38.68	13.90	4.01	0.81	0.10	0.09	57.59
Sheet Metal Workers, Region I (North of N63 latitude)								
*See per diem note on last page								
							L&M	
N1801	Sheet Metal Journeyman	58.73	13.45	15.94	0.17	0.12		88.41
	Brazing, soldering or welding of metals							
	Demolition of sheet metal HVAC & HVAC-R systems							
	Fabrication and installation of heating, ventilation and air conditioning ducts and equipment							
	Fabrication and installation of interior and exterior wall sheathing, siding, metal roofing, flashing, gutters, decking and architectural sheet metal work							
	Fabrication and installation of louvers and hoods							
	Fabrication and installation of sheet metal lagging							
	Fabrication and installation of stainless steel commercial or industrial food service equipment & wall sheathing							
	HVAC & HVAC-R Service Mechanic, servicing and maintaining and making operable HVAC & HVAC-R Systems							
	HVAC & HVAC-R systems controls and programming							
	Installation, inspection, testing, servicing, and maintenance of fire dampers, smoke control systems, smoke evacuation systems, and fire/smoke dampers							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Sheet Metal Workers, Region I (North of N63 latitude)

*See per diem note on last page

							L&M	
N1801	Sheet Metal Journeyman	58.73	13.45	15.94	0.17	0.12		88.41

Installation, servicing, and maintenance of commercial laundry systems and associated equipment

Manufacture, fabrication assembly, installation and alteration of all ferrous and nonferrous metal work

Metal lavatory partitions

Preparation of drawings taken from architectural and engineering plans required for fabrication and erection of sheet metal work

Sheet Metal shelving, lockers

Sheet Metal venting, chimneys and breaching

Skylight installation

Testing, Adjusting and Balancing (TAB) of all HVAC & HVAC-R mechanical systems as well as the cleaning of those systems

Sheet Metal Workers, Region II (South of N63 latitude)

*See per diem note on last page

							L&M	
S1801	Sheet Metal Journeyman	52.08	13.45	15.30	2.08	0.43		83.34

Brazing, soldering or welding of metals

Demolition of sheet metal HVAC & HVAC-R systems

Fabrication and installation of heating, ventilation and air conditioning ducts and equipment

Fabrication and installation of interior and exterior wall sheathing, siding, metal roofing, flashing, decking and architectural sheet metal work

Fabrication and installation of louvers and hoods

Fabrication and installation of sheet metal lagging

Fabrication and installation of stainless steel commercial or industrial food service equipment & wall sheathing

HVAC & HVAC-R Service Mechanic, servicing and maintaining and making operable HVAC & HVAC-R Systems

HVAC & HVAC-R systems controls and programming

Installation, inspection, testing, servicing, and maintenance of fire dampers, smoke control systems, smoke evacuation systems, and fire/smoke dampers

Installation, servicing, and maintenance of commercial laundry systems and associated equipment

Manufacture, fabrication assembly, installation and alteration of all ferrous and nonferrous metal work

Metal lavatory partitions

Preparation of drawings taken from architectural and engineering plans required for fabrication and erection of sheet metal work

Sheet Metal shelving, lockers

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Sheet Metal Workers, Region II (South of N63 latitude)							
*See per diem note on last page							
S1801	Sheet Metal Journeyman	52.08	13.45	15.30	2.08	L&M 0.43	83.34
	Sheet Metal venting, chimneys and breaching						
	Skylight installation						
	Testing, Adjusting and Balancing (TAB) of all HVAC & HVAC-R mechanical systems as well as the cleaning of those systems						
Sprinkler Fitters							
*See per diem note on last page							
A1901	Sprinkler Fitter	60.67	12.40	18.45	0.54	L&M 0.25	92.31
Surveyors							
*See per diem note on last page							
A2001	Chief of Parties	59.93	13.48	14.64	1.30	L&M 0.10	89.45
A2002	Party Chief	55.78	13.48	14.64	1.30	L&M 0.10	85.30
A2003	Line & Grade Technician/Office Technician/GPS, Drones	52.77	13.48	14.64	1.30	L&M 0.10	82.29
A2004	Associate Party Chief (including Instrument Person & Head Chain Person)/Stake Hop/Grademan	50.31	13.48	14.64	1.30	L&M 0.10	79.83
A2006	Chain Person (for crews with more than 2 people)	45.29	13.48	14.64	1.30	L&M 0.10	74.81
Truck Drivers							
*See per diem note on last page							
A2101	Group I, including:	51.58	13.48	14.64	1.30	L&M 0.10	81.10
	Air/Sea Traffic Controllers						
	Ambulance/Fire Truck Driver (EMT certified)						
	Boat Coxswain						
	Captains & Pilots (air & water)						
	Deltas, Commanders, Rollagons, & similar equipment (when pulling sleds, trailers or similar equipment)						
	Dump Trucks (including articulating end dumps, rockbuggy, side dump, belly dump, & trucks with pups) over 40 yards up to & including 60 yards						
	Fueler						
	Helicopter Transporter						

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Truck Drivers

*See per diem note on last page

A2101	Group I, including:	51.58	13.48	14.64	1.30	L&M 0.10	81.10
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Liquid Vac Truck/Super Vac Truck
 Material Coordinator or Purchasing Agent
 Oil Distributor Truck
 Ready-mix (over 12 yards up to & including 15 yards) (over 15 yards to be negotiated)
 Semi with Double Box Mixer
 Tireman, Medium Duty (Truck Tires up to 1200-24")
 Water Wagon (250 Bbls and above)

A2102	Group 1A including:	53.05	13.48	14.64	1.30	L&M 0.10	82.57
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Dump Trucks (including rockbuggy, side dump, belly dump & trucks with pups) over 60 yards up to & including 100 yards (over 100 yards to be negotiated)
 Jeeps (driver under load)
 Lowboys, including tractor attached trailers & jeeps, up to & including 12 axles (over 12 axles or 150 tons to be negotiated)
 Tireman Heavy Duty (earthmover tires, i.e., loader, scraper, haul truck)

A2103	Group II, including:	50.12	13.48	14.64	1.30	L&M 0.10	79.64
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All Deltas, Commanders, Rollagons, & similar equipment
 Batch Trucks (8 yards & up)
 Batch Trucks (up to & including 7 yards)
 Boom Truck/Knuckle Truck (over 5 tons)
 Cacasco Truck/Heat Stress Truck
 Construction and Material Safety Technician
 Dump Trucks (including articulating end dump, rockbuggy, side dump, belly dump, & trucks with pups) over 20 yards up to & including 40 yards
 Gin Pole Truck, Winch Truck, Wrecker (truck mounted "A" frame manufactured rating over 5 tons)
 Mechanics
 Partsman
 Ready-mix (up to & including 12 yards)
 Stringing Truck
 Turn-O-Wagon or DW-10 (not self loading)

A2104	Group III, including:	49.17	13.48	14.64	1.30	L&M 0.10	78.69
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Boom Truck/Knuckle Truck (up to & including 5 tons)
 Dump Trucks (including articulating end dump, rockbuggy, side dump, belly dump, & trucks with pups) over 10 yards up to & including 20 yards
 Expeditor (electrical & pipefitting materials)

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Truck Drivers

*See per diem note on last page

							L&M	
A2104	Group III, including:	49.17	13.48	14.64	1.30	0.10		78.69

Gin Pole Truck, Winch Truck, Wrecker (truck mounted "A" frame
manufactured rating 5 tons & under)
Greaser - Shop
Semi or Truck & Trailer
Thermal Plastic Layout Technician
Traffic Control Technician
Trucks/Jeeps (push or pull)

							L&M	
A2105	Group IV, including:	48.50	13.48	14.64	1.30	0.10		78.02

Air Cushion or similar type vehicle
All Terrain Vehicle
Buggymobile
Bull Lift & Fork Lift, Fork Lift with Power Boom & Swing Attachment
(over 5 tons)
Bus Operator (over 30 passengers)
Cement Spreader, Dry
Combination Truck-Fuel & Grease
Compactor (when pulled by rubber tired equipment)
Dump Trucks (including rockbuggy, side dump, belly dump, & trucks
with pups) up to & including 10 yards
Dumpster
Expeditor (general)
Fire Truck/Ambulance Driver
Flat Beds, Dual Rear Axle
Foam Distributor Truck Dual Axle
Front End Loader with Fork
Grease Truck
Hydro Seeder, Dual Axle
Hyster Operators (handling bulk aggregate)
Loadmaster (air & water operations)
Lumber Carrier
Ready-mix, (up to & including 7 yards)
Rigger (air/water/oilfield)
Tireman, Light Duty
Track Truck Equipment
Truck Vacuum Sweeper
Warehouseperson
Water Truck (Below 250 Bbls)
Water Truck (straight)
Water Wagon, Semi

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Truck Drivers

*See per diem note on last page

							L&M	
A2106	Group V, including:	47.62	13.48	14.64	1.30	0.10		77.14

Buffer Truck
 Bull Lifts & Fork Lifts, Fork Lifts with Power Boom & Swing
 Attachments (up to & including 5 tons)
 Bus Operator (up to 30 passengers)
 Farm Type Rubber Tired Tractor (when material handling or pulling
 wagons on a construction project)
 Flat Beds, Single Rear Axle
 Foam Distributor Truck Single Axle
 Fuel Handler (station/bulk attendant)
 Gear/Supply Truck
 Gravel Spreader Box Operator on Truck
 Hydro Seeder, Single Axle
 Pickups (pilot cars & all light-duty vehicles)
 Rigger
 Swamper
 Tack Truck (welders/gear)
 Team Drivers (horses, mules, & similar equipment)

Tunnel Workers, Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

							L&M	LEG	
N2201	Group I, including:	44.28	10.55	21.51	2.00	0.35	0.20		78.89

Brakeman
 Mucker
 Nipper
 Storm Water Pollution Protection Plan Worker (SWPPP Worker -
 erosion and sediment control Laborer)
 Topman & Bull Gang
 Tunnel Track Laborer

							L&M	LEG	
N2202	Group II, including:	45.38	10.55	21.51	2.00	0.35	0.20		79.99

Burning & Cutting Torch
 Certified Erosion Sediment Control Lead (CESCL Laborer)
 Concrete Laborer
 Floor Preparation, Core Drilling
 Jackhammer/Chipping Gun or Pavement Breaker
 Laser Instrument Operator
 Nozzlemen, Pumpcrete or Shotcrete
 Pipelayer Helper

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Tunnel Workers, Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)								
*See per diem note on last page								
N2203	Group III, including:	46.37	10.55	21.51	2.00	L&M 0.35	LEG 0.20	80.98
	Miner							
	Retimberman							
N2204	Group IIIA, including:	51.18	10.55	21.51	2.00	L&M 0.35	LEG 0.20	85.79
	Asphalt Raker, Asphalt Belly Dump Lay Down							
	Drill Doctor (in the field)							
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)							
	Pioneer Drilling & Drilling Off Tugger (all type drills)							
	Pipelayer							
	Powderman (Employee Possessor)							
	Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)							
	Traffic Control Supervisor, DOT Qualified							
N2206	Group IIIB, including:	59.41	5.50	21.51	1.60	L&M 0.35	LEG 0.20	88.57
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)							
	Federal Powderman (Responsible Person in Charge)							
	Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)							
	Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)							
	Stake Hopper							
Tunnel Workers, Laborers (The area that is south of N63 latitude and west of W138 longitude)								
*See per diem note on last page								
S2201	Group I, including:	44.28	10.55	21.51	2.00	L&M 0.35	LEG 0.20	78.89
	Brakeman							
	Mucker							
	Nipper							
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)							
	Topman & Bull Gang							
	Tunnel Track Laborer							
S2202	Group II, including:	45.38	10.55	21.51	2.00	L&M 0.35	LEG 0.20	79.99
	Burning & Cutting Torch							
	Certified Erosion Sediment Control Lead (CESCL Laborer)							
	Concrete Laborer							
	Floor Preparation, Core Drilling							
Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation								

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Tunnel Workers, Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

						L&M	LEG	
S2202	Group II, including:	45.38	10.55	21.51	2.00	0.35	0.20	79.99

Jackhammer/Chipping Gun or Pavement Breaker
Laser Instrument Operator
Nozzlemen, Pumpcrete or Shotcrete
Pipelayer Helper

						L&M	LEG	
S2203	Group III, including:	46.37	10.55	21.51	2.00	0.35	0.20	80.98

Miner
Retimberman

						L&M	LEG	
S2204	Group IIIA, including:	51.18	10.55	21.51	2.00	0.35	0.20	85.79

Asphalt Raker, Asphalt Belly Dump Lay Down
Drill Doctor (in the field)
Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)
Pioneer Drilling & Drilling Off Tugger (all type drills)
Pipelayer
Powderman (Employee Possessor)
Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)
Traffic Control Supervisor, DOT Qualified

						L&M	LEG	
S2206	Group IIIB, including:	59.41	5.50	21.51	1.60	0.35	0.20	88.57

Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)
Federal Powderman (Responsible Person in Charge)
Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)
Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)
Stake Hopper

Tunnel Workers, Power Equipment Operators

*See per diem note on last page

						L&M	
A2207	Group I	58.55	12.10	16.25	1.05	0.10	88.05

						L&M	
A2208	Group IA	60.86	12.10	16.25	1.05	0.10	90.36

						L&M	
A2209	Group II	57.55	12.10	16.25	1.05	0.10	87.05

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
Tunnel Workers, Power Equipment Operators								
*See per diem note on last page								
							L&M	
A2210	Group III	56.60	12.10	16.25	1.05	0.10		86.10
							L&M	
A2211	Group IV	48.47	12.10	16.25	1.05	0.10		77.97

* Per diem is an established practice for this classification. This means that per diem is an allowable alternative to board and lodging if all criteria are met. See 8 AAC 30.051-08 AAC 30.056, and the per diem information on page vii of this Pamphlet.

** Work in combination of classifications: Employees working in any combination of classifications within the diving crew (working diver, standby diver, and tender) in a shift are paid in the classification with the highest rate for a minimum of 8 hours per shift.

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

SUBMITTED TO:
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REVISED FINAL

CONTAMINATED MATERIALS MANAGEMENT PLAN
Yakutat Water Line Extension
YAKUTAT, ALASKA

Submitted To: RESPEC
2700 Gambell Street, Suite 500
Anchorage, AK 99503
Attn: Karen Brady

Subject: REVISED FINAL CONTAMINATED MATERIALS MANAGEMENT PLAN,
YAKUTAT WATER LINE EXTENSION, YAKUTAT, ALASKA

Shannon & Wilson has prepared this Contaminated Materials Management Plan (CMMP) on behalf of RESPEC Company, LLC (RESPEC). Our scope of services was specified in our proposal dated March 21, 2024, and authorized on May 10, 2024, via subconsultant agreement between RESPEC and Shannon & Wilson.

This CMMP shall be used as guidance for contractors handling, transporting, and storing potentially contaminated materials related to the Yakutat Water Line Extension project in Yakutat, Alaska and was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this CMMP, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON, INC.

Justin Risley, EIT
Environmental Staff

Ashley Jaramillo
Senior Chemist

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Important Information

ACRONYMS

°F	degree Fahrenheit
µg/kg	micrograms per kilogram
AAC	Alaska Administrative Code
AFB	air force base
AFFF	aqueous film forming foam
ARFF	aircraft rescue and firefighting
CaCO ₃	calcium carbonate
CBY	City and Borough of Yakutat
COPC	contaminants of potential concern
CMMP	Contaminated Materials Management Plan
DEC	Alaska Department of Environmental Conservation
DOT&PF	Alaska Department of Transportation & Public Facilities
DRO	diesel range organics
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
GRO	gasoline range organics
ISM	Incremental Sampling Methodology
LL VOC	low level volatile organic compound
MTG	Migration to Groundwater
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
PAH	polynuclear aromatic hydrocarbon
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
ppm	parts per million
QEP	qualified environmental professional
QS	qualified sampler
RESPEC	RESPEC Company, LLC
RRO	residual range organics
S&W	Shannon & Wilson, Inc.
VOC	volatile organic compound
YAK	Yakutat Airport

1 INTRODUCTION

This Contaminated Materials Management Plan (CMMP) provides direction for managing contaminated soils during the Yakutat Water Line Extension project in Yakutat, Alaska. Where a conflict exists between this CMMP and project plans and specifications, the requirements of the plans and specifications shall prevail.

The goal for the project is to expand the Yakutat water utility service to the Yakutat Airport (YAK). Based on our understanding of the project, ground-disturbing activities are limited to areas immediately surrounding the expansion; materials that will be disturbed are asphalt and soils.

2 SCOPE

This CMMP includes procedures for the handling and storage of per- and polyfluoroalkyl substances (PFAS) and fuel contaminated soil, and creosote-treated wood debris impacted soil removed during excavation for the proposed expansion. Specifically, this CMMP presents methodologies for transporting and stockpiling potentially contaminated and contaminated media, equipment decontamination, health and safety guidelines, and reporting procedures. The procedures contained in this CMMP do not preclude additional site- or project-specific requirements to protect the health and safety of workers. The Contractor is responsible for the safety of their employees.

This CMMP addresses areas with potential PFAS and fuel contamination, known fuel contamination, and known creosote treated wood debris impacted soil at the YAK, as identified in Shannon & Wilson's (S&W's) environmental summary report titled Revised Final Yakutat Water Line Extension Environmental Summary Report, dated September 2025 (Appendix A). If additional information regarding PFAS or other contamination is discovered during the project, the City and Borough of Yakutat (CBY) will make this information available to the Contractor. No changes will be made to this CMMP nor implemented in the field without first notifying and obtaining approval from the Alaska Department of Environmental Conservation (DEC). The Contractor should reference the DEC's 2018 *Managing Petroleum-Contaminated Soil, Water, or Free Product during Public Utility and Right-of-Way Construction and Maintenance Projects Technical Memorandum* to ensure construction projects are conducted in line with regulatory guidance and the plans and specifications which take this guidance into account.

Due to the potential presence PFAS and fuel contamination, known presence of fuel contamination, and known creosote treated wood debris impacted soil within the project area, the Contractor will have environmental field activities performed by a Qualified Environmental Professional (QEP) or Qualified Sampler (QS), as defined by Alaska Administrative Code (AAC) 18 AAC 75.333. The Contractor will provide DEC a list of names and qualifications for the project QEP and/or QS prior to the start of the project.

3 SITE DESCRIPTION

Yakutat is located at the mouth of Yakutat Bay. The Borough of Yakutat lies in isolated lowlands along the Gulf of Alaska, 212 miles northwest of Juneau. The geographic coordinates of the YAK terminal are latitude 59.5033° N, longitude -139.9928° W in the World Geographic System 1984 (Figure 1).

Yakutat is located on the Yakutat foreland, a gently sloping glacial outwash plain between the Saint Elias Mountains and the Gulf of Alaska. Eight dominant surficial deposits have been mapped in the Yakutat area, including artificial fill, organic, eolian, beach, delta-estuarine, alluvial, outwash, and moraine deposits. Artificial fill is predominant under the airport runways and areas of the YAK that have been extensively modified during construction (U.S. Army Corps of Engineers, 2008).

4 SUMMARY OF KNOWN CONTAMINATION

The YAK is a Title 14, Code of Federal Regulations, Part 139 certified airport. Part 139 certification is administrated by the Federal Aviation Administration (FAA) and serves to ensure air transportation safety by requiring, among other things, the provision of aircraft rescue and firefighting (ARFF) services.

Aqueous film forming foam (AFFF) is an FAA-approved extinguishing agent for ARFF response at Part 139 airports. AFFF is a surfactant known to contain PFAS that effectively and rapidly suppresses flammable-liquid fires. PFAS are persistent in the environment and human body, causing potential adverse health effects. Storage and historical use of AFFF during ARFF training and/or emergency response activities at YAK have led to the known PFAS contamination of environmental media at and near the YAK. Additionally, the DEC has designated several contaminated sites related to PFAS and other releases within the vicinity of the project. Exhibit 4-1 summarizes these contaminated sites.

Exhibit 4-1: Summary of Contaminated Sites at YAK

Name	DEC File Number	Hazard ID	Location	Status
FAA Yakutat Bldg 607	1530.38.007	2377	Yakutat Airport, AK	Active
DOT&PF Yakutat Former Shop Building	1530.38.017	25483	Yakutat Airport, AK	Active
NOAA NWS Former Employee Housing	1530.38.024	27902	Yakutat Airport, AK	Active
NOAA Yakutat Office	1530.38.006	2972	Yakutat Airport, AK	Active
Yakutat AFB State Disposal Site No.3	1530.38.011	26914	Yakutat Airport, AK	Active

AFB = air force base; DOT&PF = Alaska Department of Transportation and Public Facilities; FAA = Federal Aviation Administration; NOAA = National Oceanic and Atmospheric Administration; NWS = National Weather Service

In December 2024, S&W advanced 29 soil borings (Figure 2) along the anticipated extension project collecting soil samples as indicated by field screening results for laboratory analysis and installing a temporary well point for drinking water analysis.

The soil analytical results from the December 2024 sampling showed detections for gasoline range organics (GRO), diesel range organics (DRO), eight volatile organic compounds (VOCs), two polynuclear aromatic hydrocarbons (PAHs), two PFAS (including perfluorooctanesulfonic acid [PFOS]), and lead in one or more sample. We compared the soil sample results to the most stringent values between the DEC cleanup levels in 18 AAC 75.341 Table B1 and B2 Method Two (Migration to Groundwater [MTG] Over 40 Inch Zone Human Health). Analytical results were below the applicable DEC soil regulatory limits, with the exception of GRO, DRO, 1,1,2-trichloroethane, 1,2-dibromoethane, 2-hexanone, and naphthalene in soil boring B-23 (red boring, Figure 2). Additionally, soil boring B-27 encountered apparent creosote-treated wood debris (Figure 2).

The drinking water analytical results showed detections for three PFAS, twelve total metals, two dissolved metals, hardness as calcium carbonate (CaCO₃), total alkalinity as CaCO₃, nitrite, chloride, sulfate, pH, total dissolved solids, and Langelier index. The detected results were below the Environmental Protection Agency (EPA) Maximum Contaminant Levels. However, the analytes total iron, aluminum, dissolved manganese, and total manganese exceeded the EPA Secondary Maximum Contaminant Levels. The environmental summary report titled Revised Final Yakutat Water Line Extension Environmental Summary Report, dated September 2025 is included in Appendix A.

The Revised Final Yakutat Water Line Extension Environmental Summary Report provides preliminary information to help the Contractor develop an approach to segregating contaminated media during construction. It is the Contractor's responsibility to adequately characterize soil generated during this project for waste-disposal purposes.

5 CONTAMINANTS OF POTENTIAL CONCERN

Based on the information available for this project, the primary contaminants of potential concern (COPCs) for the site are PFOS, perfluorooctanoic acid (PFOA), fuel related compounds, and creosote-treated wood.

Materials identified as potentially contaminated with COPCs will be stockpiled based on the following sections, with separate stockpiles for asphalt and soils (refer to Section 6 for determination of potentially contaminated soils). Stockpile samples will be collected and analyzed for the COPCs detailed in Exhibit 5-1 as part of waste characterization. The analyzing laboratory and analytical method chosen must be approved by DEC.

Exhibit 5-1: Site COPCs and Test Methods

Analyte	Test Method	DEC Cleanup Level
PFAS ¹	Environmental Protection Agency (EPA) Method 1633	3.0 µg/kg for PFOS
		1.7 µg/kg for PFOA
Pentachlorophenol (PCP) ³	EPA 8151A	0.0043 mg/kg
gasoline range organics (GRO)	Alaska Method (AK) 101	260 mg/kg
diesel range organics (DRO)	AK 102	230 mg/kg
residual range organics (RRO)	AK 103	9,700 mg/kg
polychlorinated biphenyl (PCB)	EPA 8082	Analyte Specific
lead	EPA 6020	400 mg/kg
polynuclear aromatic hydrocarbons (PAHs) naphthlene	EPA 8270 Selected Ion Monitoring (SIM)	Analyte Specific 0.038 mg/kg
volatile organic compounds (VOCs) 1,1,2-trichloroethane, 1,2-dibromoethane, 2-hexanone	EPA 8260	Analyte Specific 0.0014 mg/kg 0.00024 mg/kg 0.11 mg/kg
low level volatile organic compounds (LL VOCs)	EPA 8260-SIM	Analyte Specific

Notes:

¹ PFAS will only be analyzed for stockpiles generated within the yellow area shown in Figure 2.

² Pentachlorophenol will only be analyzed for stockpiles generated from creosote-treated wood impacted soil (within 100 feet of Boring B-27 between project station 50+22 to 52+00, area in blue Figure 2).

µg/kg = micrograms per kilogram; mg/kg = milligrams per kilogram

The current DEC MTG soil cleanup levels are referenced in this CMMP. However, PFAS cleanup levels are anticipated to change in the future. Updated cleanup levels would result in changes to this CMMP, in which case additional DEC coordination and approval will be necessary. Based on our current understanding of PFAS concentrations in soil within the project area, excavated material can be temporarily stockpiled and reused on the site in areas with similar PFAS concentrations. Excess material should be stockpiled and sampled

for waste characterization after project completion. Further discussion regarding stockpiles with respect to surface water drainage is provided in Section 9.

The analytical results will be compared to the most stringent DEC 18 AAC 75.341 Table B1. Method Two and Table B2. Method Two Over 40 Inch Zone – Human Health or MTG cleanup levels to determine if the materials will require removal from the site or if the materials can be spread at the site. We note again that DEC anticipates an update to the PFAS MTG cleanup levels; analytical results should be compared to the DEC MTG cleanup levels in effect at the time the sample data are reported. The results must be presented to DEC prior to movement of the stockpiled material offsite for reuse or disposal. Approval to transport materials offsite shall be obtained using a DEC Contaminated Soil Transport and Treatment Approval Form (Appendix B).

6 SEGREGATION OF CONTAMINATED SOIL

Design plans for the extension project describe the laying of pipes and supporting water utility infrastructure from the existing utility system to the airport. We assume some of the excavated material will be reused in the areas from which they were extracted. Excess soils that are not planned for reuse will be segregated based on criteria defined in this section. 18 inches of clean fill (or potentially clean fill as defined in section 6.1, below) will be placed around the sides and top of the water main in areas where fuel contamination or creosote impacted soil is encountered, as detailed in the project plans and specifications.

Material classification/segregation is necessary to avoid comingling material excavated from areas with higher degrees of contamination with that from potentially clean areas or those with lower contaminant concentrations. This is done to minimize the waste volumes because the concentrations of detected contaminants will govern the disposal criteria.

Excavated material within the yellow and blue areas shown on Figure 2 will be field screened with a photoionization detector (PID) to assess the presence of fuel hydrocarbons and creosote-treated wood impacted soil for material segregation purposes. Additional details regarding field screening methods are provided in the following subsection (6.1).

Field-screening methods are not available for PFAS-contaminated soil to assist in stockpile segregation. Therefore, the excavation areas will be classified based on the initial PFAS analytical results. Figure 2 presents two levels of PFAS contamination that could be present at the site:

1. PFOS/PFOA detected below the MTG cleanup level or other PFAS detected with no MTG cleanup level (yellow area Figure 2), and

2. PFOS/PFOA and other PFAS not detected (green and blue area Figure 2).

We note that prior testing did not show results of PFOS/PFOA exceeding the DEC MTG cleanup level.

If the presence of fuel or creosote-treated wood debris is not observed in excess soils (see Section 6.1 below), the soils may be used as fill in areas with similar PFOS/PFOA classification/contamination (categories 1 and 2 above). However, soils from within 25 feet of soil boring B-23 (project station 222+75 to 223+25, red soil boring in Figure 2) are ineligible for reuse as fill material unless analytically sampled and results indicate that COPCs (See Exhibit 5-1, except PCP) are below DEC soil cleanup levels. Soils where the presence of fuel and/or creosote-treated wood debris is observed or soils within 25 feet of soil boring B-23 (between project station 222+75 to 223+25, red soil boring in Figure 2) will be segregated into the stockpiles noted below and will be stockpiled and sampled in accordance with Section 9.

Stockpiles will be segregated as follows based on the likely contaminants present:

- Creosote-treated wood debris and soils surrounding soils impacted by creosote-treated wood debris, those with 100 feet of boring B-27 between project station 50+22 to 52+00 (area in blue in Figure 2).
- Potentially fuel contaminated soils (see Section 6.1., area in green in Figure 2).
- Excess soil, potentially PFAS contaminated soil (category 1, above, area in yellow in Figure 2).
- Potentially fuel contaminated (see Section 6.1.) and potentially PFAS-contaminated soils (area in yellow in Figure 2).
- Fuel contaminated and potentially PFAS contaminated soils, those within 25 feet of boring B-23 between project station 222+75 to 223+25 (red soil boring in Figure 2).

Soil may require offsite disposal if stockpile sampling indicates COPCs exceeding the DEC MTG cleanup levels. A copy of the DEC Contaminated Media Transport and Treatment or Disposal Approval Form is included in Appendix B.

6.1 Field Screening for Fuel Contaminants

Fuel contamination above DEC soil cleanup levels at soil boring B-23, and creosote-treated wood debris impacted soil, at soil boring B-27, has been identified within portions of the excavation area. The Contractor will provide a QEP/QS to field screen excavated soils as shown in blue and yellow in Figure 2. The Contractor's QEP/QS will field-screen soils excavated within 100 feet of B-27 (project station 50+22 to 52+00, area in blue Figure 2), and the soil checked for creosote-treated wood debris. Additional field screening will be conducted for the remaining excavations extending from the Yakutat Road/Colorado Road

intersection towards the YAK (Figure 2, areas in yellow) Field screening will be conducted within 25 feet of soil boring B-23 (project station 222+75 to 223+25) however, regardless of field screening results, soil excavated from this area is ineligible for reuse as fill material unless analytically sampled and results indicate that COPCs (see Exhibit 5-1, except for PCP) are below DEC soil cleanup levels.

The QEP/QS will use a hand-held PID equipped with a 10.6 electron volt lamp to detect volatile fuel compounds. The PID measures total volatile compounds present as vapors, which is a semi-quantitative indication of hydrocarbons present. The PID will be calibrated daily, or more often as needed, to 100 parts per million (ppm) isobutylene standard according to the manufacturer's instructions. The QEP/QS will be trained and experienced in the calibration, operation, routine maintenance, and troubleshooting of the PID, as well as interpreting PID results.

The QEP/QS will collect field screening samples at a frequency of 1 for every 10 cubic yards of excavated soil, with a minimum of one per excavation area. Field screening samples will be collected using a clean, stainless-steel spoon from freshly uncovered soil (directly from the excavator bucket or side-cast material). The soil will be placed in a clean, resealable plastic bag, filling it one-third to one-half full and quickly sealing it closed. The field screening samples will be analyzed using the heated-headspace method defined below.

The QEP/QS will:

- allow the headspace to develop in the bag by warming it to at least 40 degrees Fahrenheit (°F) for 10 minutes to one hour and shaking the bag for 15 seconds at the beginning and end of the period to assist volatilization;
- open the bag just enough to allow insertion of the PID probe about one-half the headspace depth, taking care to avoid uptake of water droplets and soil particles; and
- record the maximum PID reading obtained, noting any erratic meter response at high organic-vapor concentrations or conditions of elevated headspace moisture.

With respect to fuel contamination, soils will be categorized as potentially clean, potentially contaminated, or contaminated based on the following criteria:

- Potentially clean - soil that does not exhibit visible staining or fuel odor, and headspace sample results are less than 10 ppm.
- Potentially contaminated - soils with visible staining, fuel odor, or headspace sample results greater than 10 ppm.
- Contaminated - soil located within 25 feet of soil boring B-23 (project station 222+75 to 223+25, red boring in Figure 2).

Soils determined to be potentially clean can be re-used in the originating excavation area or in another area with similar PFAS concentrations (categories 1 and 2, above). Potentially fuel-contaminated and fuel contaminated soils are not eligible for reuse unless analytically sampled for the COPCs listed in Exhibit 5-1 and will be stockpiled and sampled in accordance with Section 9. Potentially contaminated and contaminated soil stockpiles shall undergo sampling for waste characterization and potential disposal for COPCs listed in Exhibit 5-1 as noted in Section 10. Soils determined to be potentially clean shall be stored separately from stockpiled soil exhibiting potential fuel contamination, creosote treated wood debris, or soil located within 25 feet of soil boring B-23 (project station 222+75 to 223+25, red boring in Figure 2). Material contacting contaminated soil shall be considered contaminated and disposed of accordingly.

If free product is observed on water (i.e. a sheen), the Contractor must remove the sheen using sorbent pads or containment booms, to the extent practicable.

7 EXCAVATED SOIL STORAGE

Soils that require temporary storage prior to replacement in the excavation or transportation to the designated stockpile area will be placed on a liner near the excavation origin, as practicable. Material shall be returned to the excavation area or transported to the designated stockpile area within 24 hours of completing work at the specific excavation location.

Staging areas used to stockpile the excess materials must be selected by the project team and approved by DEC prior to the start of construction. A figure including the staging and area must be included in with the information submitted to DEC for approval. Before constructing a containment cell, the ground surface underlying the planned footprint of the stockpile liner should undergo baseline sampling. The area utilized for the stockpile will be sampled again following disposal of the contained material and the results will be compared to the baseline sample results to verify the effectiveness of the containment measures. The Contractor shall document the quantity of soil removed from each location and the portions stockpiled and/or those returned to the excavation.

The analytical results included in Appendix A are not to be used for final waste disposal requests. The Contractor shall perform additional analytical sampling of the stockpiles for waste-characterization purposes in accordance with Sections 9 and 10. The Contractor shall provide the waste characterization results to CBY and DEC.

8 SOIL EXCAVATION CONSIDERATIONS

1. Excavation activities shall be performed in a manner that minimizes worker exposure to contaminants in soil and does not result in a release of contamination or unacceptable exposure risk to human health and/or the environment.
2. A designated work area shall be established around the known contamination excavation areas. Trucks will enter and exit each work area through a single-entry point.
3. If excavated material needs to be temporarily stored prior to returning the soil to the original excavation, it will be placed on a liner near the excavation origin. Material shall be returned to the excavation area or be transported to the appropriate storage site within 24 hours of completing work at the specific excavation.
4. Equipment leaving work areas where fuel-contaminated soils are potentially present, as determined by field screening (Figure 2), will be decontaminated before driving to the stockpile area. If equipment contacts contaminated soil in the stockpile area, it will also be decontaminated prior to leaving the stockpile area. See the decontamination procedures detailed in Section 11.
5. No contaminated material will be moved into a zone of lesser contamination unless the contaminated material is placed on a suitable liner (see Exhibit 9-1). We note that PFAS were detected in areas where excavation is planned. Material shall not be placed into an area where PFAS has not been detected without DEC approval prior to transport.
6. If dewatering is required, the Contractor is responsible for obtaining the necessary permits and approval for dewatering and/or temporary water use from DEC and Alaska Department of Natural Resources. The Contractor shall include best management practices for dewatering PFAS contaminated groundwater, if encountered.
7. Operators will work from the safety of their respective equipment cabs. Manual labor to excavate material is not expected. Personnel will wear proper personal protective equipment and follow decontamination procedures defined in Section 11.

9 STOCKPILE PROCEDURES AND CHARACTERIZATION

This section describes the stockpile general handling requirements listed in 18 AAC 75.370.

1. Stockpiles will be located within the staging area approved by DEC and others as required based on the stockpile locations, to be determined prior to the commencement of construction.
2. Stockpiles must be at least 100 feet from surface waters and should not be placed within the DEC Drinking Water Program – Drinking Water Protection Zones, see Appendix C.
3. Excavated material must be segregated based on the criteria established in Section 6.

4. Incremental Sampling Methodology (ISM) soil samples shall be collected from the footprint of each stockpile staging area prior to liner installation and in the area where spreading of excess material may occur. ISM soil samples shall also be collected after stockpile decommissioning. ISM samples will be collected by dividing the stockpile footprint into 30 equivalent subunits, assuming a maximum stockpile footprint of 10,000 square feet, collecting sample increments from each subunit, and compositing the sample into laboratory provided sample containers. Refer to the Interstate Technology Regulatory Council Technical/Regulatory Guidance – Incremental Sampling Methodology (ISM) Update, dated October 2020, for additional information regarding ISM sampling. We note that pre- and post-liner sampling is not required if the stockpile is placed on a paved surface. Pre and post liner samples should be submitted for COPCs as noted below.
 - a. The creosote-treated wood debris impacted soil stockpile staging area (soils obtained from within 100 feet of soil boring B-27 located between project station 50+22 to 52+00, area in blue in Figure 2) should be sampled for the analyses listed in Exhibit 5-1, excluding PFAS.
 - b. The potentially fuel contaminated soil stockpile staging area (see Section 6.1., soils obtained from the green area in Figure 2) should be sampled for the analyses listed in Exhibit 5-1, excluding PFAS and PCP.
 - c. The excess soil, potentially PFAS contaminated soil stockpile staging area (category 1 listed in Section 6, soil obtained from the yellow area in Figure 2) should be sampled for PFAS.
 - d. The potentially fuel contaminated (see Section 6.1) and potentially PFAS-contaminated (category 1 listed in Section 6, soil obtained from the yellow area in Figure 2) soil stockpile staging area should be sampled for the analyses listed in Exhibit 5-1, excluding PCP.
 - e. The fuel contaminated soil (See Section 6.1) and potentially PFAS contaminated soil (category 1 listed in Section 6) stockpile staging area should be sampled for the analyses listed in Exhibit 5-1, excluding PCP.
5. The Contractor shall report the post-stockpile ISM sample results to CBY.
6. Stockpiles will be constructed according to the diagram in Appendix D.
7. Stockpiles must be constructed using bottom and top impermeable liners. The bottom liner will meet the general strength and thickness requirements as described in Table D found in 18 AAC 75.370 and summarized in Exhibit 9-1 below. The top liner will be a minimum 11-mil product or equivalent.
8. 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. Wattle ends will be overlapped by two feet and tied together. Edges of the bottom liner will fold back up and over the wattle and stockpile base by a minimum of five feet to contain any

- settlement and potential leaks from within. The top liner will overlap the bottom liner's edge by at least three feet.
9. During periods of inactivity or when excavation is complete, stockpile liners and covers will be lashed down with ropes and anchored with 60-pound sandbags, replaced as needed. Efforts shall be made to minimize precipitation from entering the stockpile.
 10. Stockpiles shall be adequately marked. Traffic safety cones or candlestick bollards are required around the perimeter of the stockpiles. The signs will have a durable backboard and be weatherproof with letters readable from 20 feet away showing the following: contaminant/s of concern, point of contact for the Contractor (name and phone number), point of contact for the CBY (name and phone number), state project number, and generation date. Signs will be maintained in readable condition and shall remain in place for the duration of stockpile storage use. Contractors shall use the signage template included in Appendix D.
 11. Stockpiles will be regularly inspected and maintained to ensure the covers remain 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. The Contractor will inspect the stockpiles daily during daily during accumulation. Once stockpile accumulation is complete, the CBY Project Inspector shall approve the stockpile construction specifications and site security. Once approval is given by the inspector, stockpile inspections will occur once weekly. After the project's completion, the stockpile will be inspected by CBY staff twice a month and after storm/wind events. Inspections will be documented, and records sent biannually as described in the Reporting Procedures in Section 13. Any access openings made to the liner (e.g., accidental tears, etc.) shall be immediately sealed off to prevent wind and rain intrusion.
 12. Leachate is not anticipated to be generated at the stockpile during rain events because contaminated material will be securely covered. In the unlikely event that leachate does occur, it will be pumped into containers within the immediate stockpile area. DEC will be notified of any leachate accumulation.

Exhibit 9-1: 18 AAC 75 Table D, Bottom Liner Specifications; Long-term Storage of Petroleum-Contaminated Solids (180 days to two years)

Method	Coated Fabric	Extruded Fabric
Cold Crack (ASTM D 2136-02(2012), updated 2012)	-60°F	-60°F
Black carbon content (ASTM D 1603-12, updated May 2012)	two percent or greater	two percent or greater
Tensile strength (ASTM D 751-06(2011), updated 2011)	300 pounds (warp)	N/A
Mullen burst (ASTM D 751-06(2011), updated May 2011)	500 pounds per square inch (psi)	N/A
One-inch tensile strength (ASTM D 882- 12, updated August 2012)	N/A	45 pounds (warp)

Method	Coated Fabric	Extruded Fabric
One inch elongation MD (machine direction)	N/A	625 percent
Nominal thickness	20 mil	20 mil
Oil resistance (ASTM D 471-12a, updated December 2012)	No signs of deteriorate and more than 80 percent retention of tensile and seam strength after immersion for 30 days at 73°F	No signs of deteriorate and more than 80 percent retention of tensile and seam strength after immersion for 30 days at 73°F

10 DISPOSAL OF CONTAMINATED MEDIA

The analytical results included in the Revised Final Yakutat Water Line Extension Environmental Summary Report (Appendix A) are not to be used for final waste-characterization purposes. That preliminary sampling was conducted to assist with project planning and to support the development of this CMMP.

The Contractor's QEP/QS will collect discrete samples from the stockpiles in accordance with the DEC Field Sampling Guidance. The frequency of field screening and sampling will be consistent with Table 2A of the Field Sampling Guidance. Analytical samples will be analyzed as follows based on the location and probably contaminants in the soil as follows:

- a. The creosote-treated wood debris impacted soil stockpile (soils obtained from within 100 feet of soil boring B-27 located between project station 50+22 to 52+00, area in blue in Figure 2) should be sampled for the analyses listed in Exhibit 5-1, excluding PFAS.
- b. The potentially fuel contaminated soil stockpile (see Section 6.1., soils obtained from the green area in Figure 2) should be sampled for the analyses listed in Exhibit 5-1, excluding PFAS and PCP.
- c. The excess soil, potentially PFAS contaminated soil stockpile (category 1 listed in Section 6, soil obtained from the yellow area in Figure 2) should be sampled for PFAS.
- d. The potentially fuel contaminated (see Section 6.1) and potentially PFAS-contaminated (category 1 listed in Section 6, soil obtained from the yellow area in Figure 2) soil stockpile should be sampled for the analyses listed in Exhibit 5-1, excluding PCP.
- e. The fuel contaminated soil (See Section 6.1) and potentially PFAS contaminated soil (category 1 listed in Section 6) stockpile should be sampled for the analyses listed in Exhibit 5-1, excluding PCP.

The analyzing laboratory and analytical method chosen must be approved by a DEC Contaminated Site approved laboratory. The Contractor shall seek approval from DEC prior

to transporting the material to a waste disposal facility (for stockpile results that exceed regulatory limits) or spreading the soils at the site (for detectable analytes below regulatory limits). The DEC Contaminated Media Transport and Treatment or Disposal Approval Form is included in Appendix B.

We note that based on the results shown in Appendix A, it is likely PFAS will be detected in the stockpiled material from around the airport.

If the waste characterization results show PFOS, PFOA, or other COPCs above their associated DEC regulatory limits, the soil will be disposed of at an appropriate facility authorized to accept material containing the detected contaminants. The Contractor will coordinate approval to transport and dispose of contaminated media with DEC, and the approved facility using the DEC Contaminated Media Transport and Treatment or Disposal Approval Form (Appendix B).

If the waste characterization results show PFOS, PFOA, and other COPCs below their DEC regulatory limits, the Contractor shall note the volume and intended final destination and seek approval from DEC prior to spreading the material. Spreading areas must be selected by the project team and approved by DEC prior to the start of construction. A figure including the spreading area must be included with the information submitted to DEC for approval.

The Contractor shall submit a report to DEC with the waste characterization results included. As mentioned above, materials must be spread in areas of equal or greater PFAS or other COPC concentrations.

11 DECONTAMINATION PROCEDURES

Contractors will adhere to the following decontamination guidelines to minimize cross-contamination.

1. Heavy equipment or hand tools that come into contact with contaminated material will be brushed to remove visible soil before leaving the stockpile storage site or work area boundaries. At the conclusion of work in each area, Contractors will decontaminate equipment by using a brush to remove as much soil from the equipment or tooling as practicable.
2. If the Contractor identifies evidence of additional contamination, such as fuel odors or staining, the Contractor will report this to CBY and decontaminate heavy equipment prior to leaving the work area. The Contractor shall adhere to field screening procedures described in Section 6.

12 SPILL REPORTING PROCEDURES

If a previously unknown source of contamination is encountered or a new release occurs, the Operator or QEP must immediately notify the appropriate personnel according to the procedure shown in Exhibit 12-1.

Exhibit 12-1: Contaminated Soil Reporting Procedure

Contaminated-Soil Reporting Procedure

- 1: Operator or QEP identifies previously unknown contamination or witnesses a spill.
- 2: Operator or QEP notifies the CBY Project Manager.
- 3: The CBY Project Manager notifies the DEC PPR Program @ 1-800-478-9300

The DEC Spill Reporting Placard is included in Appendix E and should be always displayed at the project site during construction activities.

13 HEALTH AND SAFETY PROCEDURES

The Contractor is responsible for the health and safety of their employees; they should address potential exposures to PFAS and fuel contaminated soils as part of their project planning.

14 REPORTING PROCEDURES

When project work is complete, the Contractor will submit a report to CBY. The report will include the following items.

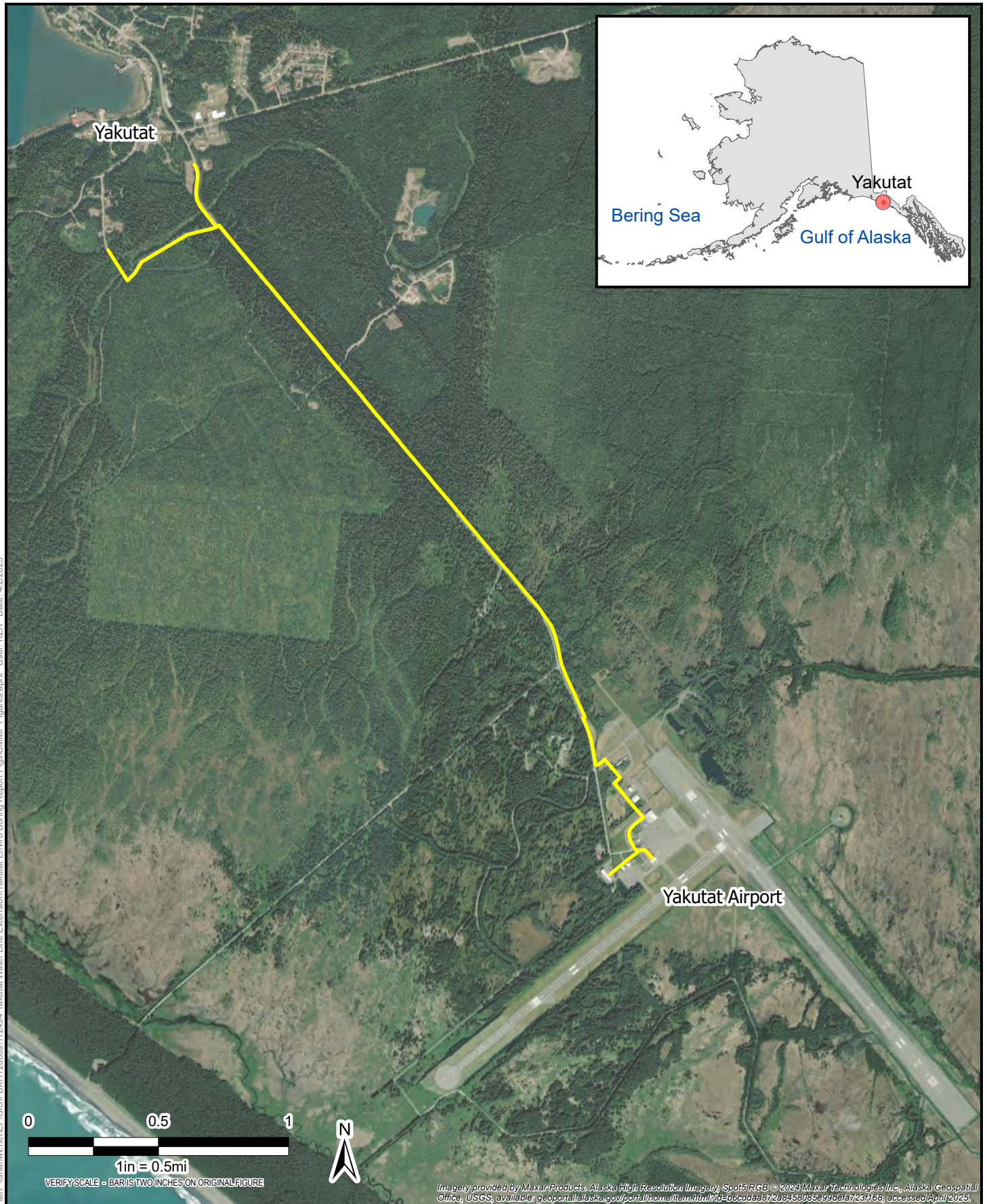
1. A summary of soil movement including the quantities and locations of materials returned to each of their excavations or transported to the designated stockpile areas.
2. Date and time of stockpile inspections during active construction to describe the condition of the stockpile and photographs. The Contractor shall note any accumulation of leachate within liners.
3. Condition of the Stockpile Storage Sites before and after construction activities.
4. Waste characterization results and copies of the approved DEC Transport, Treatment or Disposal Approval Form.

The Contractor shall provide CBY with the stockpile inspection information collected during the project. The Contractor staff will submit documentation of the stockpile

inspections, including a log of date, time, and any necessary notes such as accidental tears, flooding in the area, leachate, etc. to DEC. The report should also include photos.

15 REFERENCES

- Alaska Department of Environmental Conservation, Contaminated Sites Search, State of Alaska (2022a), accessed 3 July 2023 on <https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/Search/>.
- Alaska Department of Environmental Conservation, Drinking Water Protection Areas Map, State of Alaska (2022b), accessed 12 October 2022 on <https://dec.alaska.gov/eh/dw/dwp/protection-areas-map/>.
- Alaska Department of Environmental Conservation, August 2024, Field Sampling Guidance, accessible on <https://dec.alaska.gov/spar/csp/guidance-forms>.
- Alaska Department of Environmental Conservation September 2018, *Managing Petroleum-Contaminated Soil, Water, or Free Product during Public Utility and Right-of-Way Construction and Maintenance Projects Technical Memorandum*, accessible on <https://dec.alaska.gov/spar/csp/guidance-forms>.
- Interstate Technology Regulatory Council, October 2020, Technical/Regulatory Guidance – Incremental Sampling Methodology (ISM) Update, accessible on https://ism-2.itrcweb.org/wp-content/uploads/2020/11/itrc_ism_compiled_508_011921.pdf.
- U.S. Army Corps of Engineers (USACE), 2008. Military Munitions Response Program Preliminary Assessment for Yakutat Air Base, Yakutat, Alaska, Property Number F10AK0606. July.

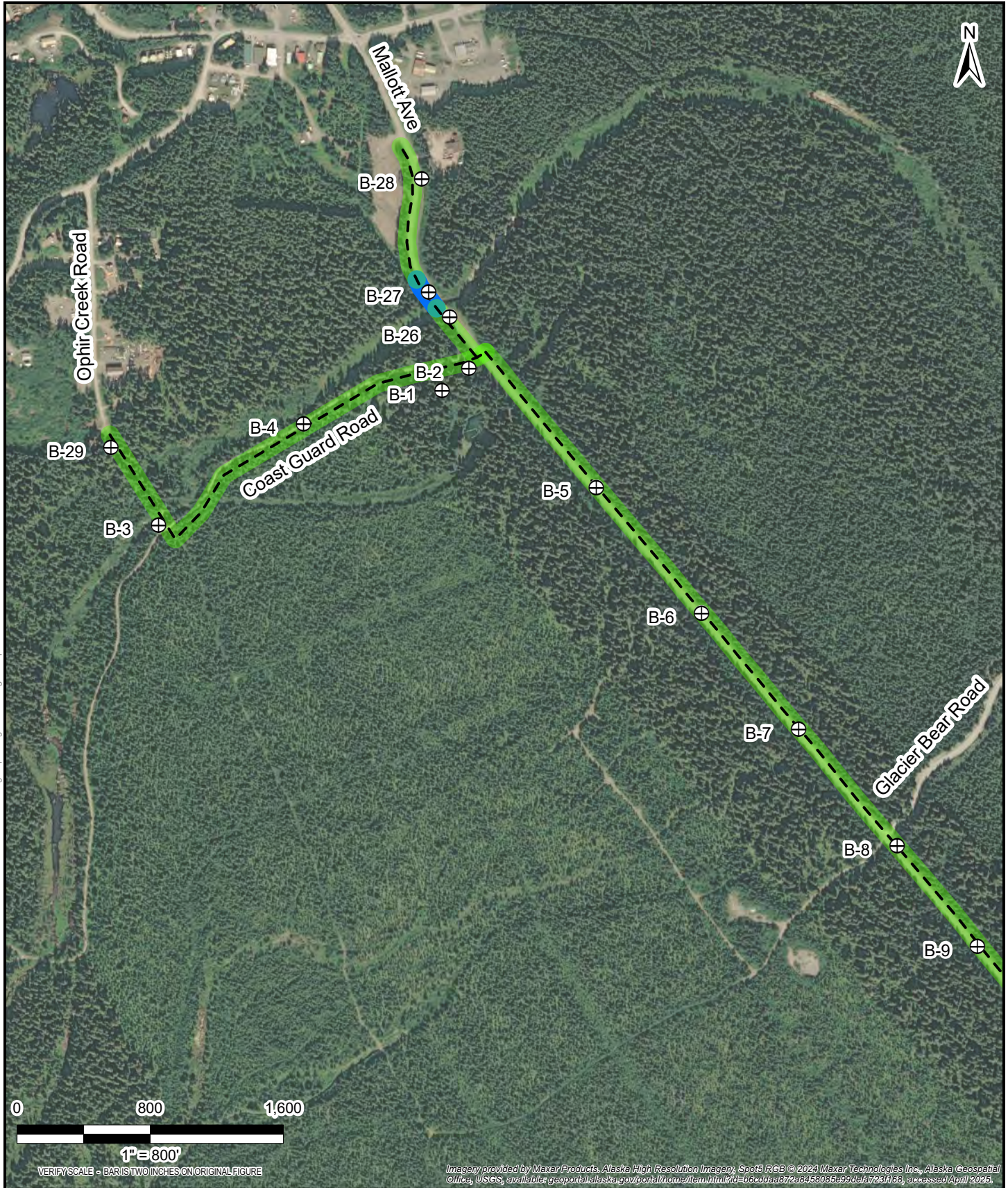


LEGEND

— Proposed Waterline Alignment

VICINITY MAP
September 2025
FIGURE 1

Spatial Reference: NAD 1983 2011 StatePlane Alaska 1 FIPS 5001 Feet WKID: 102445
Path: \\shannonwilson\GIS\FBX\112000s\112494 Yakutat Water Line Extension\Yakutat Enviro Boring Report Figs\CMMP Figures.aprx User: KZR Date: 4/2/2025



LEGEND

Contamination Levels

- Creosote-Treated Wood Debris; Field Screening Required
- Level 1 - PFOS/PFOA Detected Below DEC Soil CUL or Other PFAS Detected With No DEC Soil CUL; Field Screening Required
- Level 2 - PFOS/PFOA and Other PFAS Not Detected

+

 Soil Boring

Proposed Waterline Alignment

SITE PLAN
September 2025
FIGURE 2
Sheet 1 of 3



Contamination Levels

- Creosote-Treated Wood Debris; Field Screening Required
 Level 1 - PFOS/PFOA Detected Below DEC Soil CUL or Other PFAS Detected With No DEC Soil CUL; Field Screening Required
 Level 2 - PFOS/PFOA and Other PFAS Not Detected

- ⊕ Soil Boring
— Proposed Waterline Alignment

SITE PLAN
September 2025
FIGURE 2
Sheet 2 of 3



Contamination Levels

- Creosote-Treated Wood Debris; Field Screening Required
- Level 1 - PFOS/PFOA Detected Below DEC Soil CUL or Other PFAS Detected With No DEC Soil CUL; Field Screening Required
- Level 2 - PFOS/PFOA and Other PFAS Not Detected; Field Screening not Required

- - Proposed Waterline Alignment
- ⊕ Soil Boring
- ⊕ Soil Boring had detections of DRO
1,1,2-trichloroethane, 1,2-dibromoethane
2-hexanone, and naphthalene above DEC Soil
CULS

SITE PLAN
September 2025
FIGURE 2
Sheet 3 of 3

Appendix A

S&W Revised Final Yakutat Water Line Extension Environmental Summary Report



SUBMITTED TO:
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REVISED FINAL

ENVIRONMENTAL SUMMARY REPORT
Yakutat Water Line Extension
YAKUTAT, ALASKA



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Submitted To: RESPEC
2700 Gambell Street, Suite 500
Anchorage, AK 99503
Attn: Karen Brady, P.E.

Subject: REVISED FINAL ENVIRONMENTAL SUMMARY REPORT, YAKUTAT WATER
LINE EXTENSION, YAKUTAT, ALASKA

Shannon & Wilson prepared this summary report and participated in this project as a subconsultant to RESPEC Company, LLC (RESPEC). Our scope of services was specified in our proposals for geotechnical and environmental services dated March 19, 2024, July 17, 2024, and September 25, 2024. This summary report presents the results of field screening and analytical soil samples collected for this project and was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this summary report, or if we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON, INC.



Ashley Jaramillo
Senior Chemist

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- Appendix A: Boring Logs
- Appendix B: Field Forms
- Appendix C: Eurofins – Sacramento Laboratory Report and LDRC
- Appendix D: Eurofins – Seattle Laboratory Report and LDRC
- Appendix E: Eurofins – South Bend Laboratory Report and LDRC
- Appendix F: Quality Control and Quality Assurance
- Important Information

ACRONYMS

AAC	Alaska Administrative Code
bgs	below the ground surface
CaCO ₃	calcium carbonate
CBY	City and Borough of Yakutat
CFR	Code of Federal Regulations
COPC	contaminant of potential concern
DEC	Alaska Department of Environmental Conservation
Discovery	Discovery Drilling
DOT&PF	Alaska Department of Transportation and Public Facilities
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
Eurofins	Eurofins Environment Testing
FAA	Federal Aviation Administration
GRO	gasoline range organics
LDRC	laboratory data review checklist
MCL	Maximum Contaminant Levels
mg/kg	milligram per kilogram
NAPL	non-aqueous phase liquid
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PFAS	per- and polyfluoroalkyl substances
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
ppm	parts per million
QEP	Qualified Environmental Professional
RRO	residual range organics
SAP	Sampling and Analysis Plan
SMCL	Secondary Maximum Contaminant Level
TDS	total dissolved solids
TWP	temporary well point
UST	underground storage tank
VOC	volatile organic compound
WO	work order

1 INTRODUCTION

Shannon & Wilson prepared this summary report to document field screening and environmental soil sampling activities during our geotechnical and environmental exploration for the Yakutat Water Line Extension project ([Project], Figure 1) in Yakutat, Alaska.

Our services were performed in general accordance with our proposals dated March 19, 2024, July 17, 2024, and September 25, 2024. This report has been prepared by Shannon & Wilson personnel who are Qualified Environmental Professionals (QEPs) as defined in Title 18 Chapter 75 of the Alaska Administrative Code (18 AAC 75.333).

The work presented in this summary report is in support of the development of this project. Shannon & Wilson's field activities obtained information on subsurface conditions by collecting soil samples for chemical analyses. The work described in this summary report covers field-screening, analytical sampling, and environmental drilling activities. Our field services and analytical sampling results were used to identify potential soil contamination that will need to be addressed during construction. We submitted a draft geotechnical recommendations report titled *Draft Geotechnical Engineering Report, Yakutat Airport Water Line Extension*, dated February 2025, to you as a stand-alone document.

1.1 Project Description

We understand that the City and Borough of Yakutat (CBY) plans to expand their existing water line approximately 4.5 miles from the City of Yakutat to the Yakutat Airport (Figure 1). Some private water supply wells at the airport have been found to contain per- and polyfluoroalkyl substances (PFAS) in exceedance of Alaska Department of Environmental Conservation (DEC) drinking water action levels and are no longer used for drinking water. In addition, in April 2024 the U.S. Environmental Protection Agency (EPA) promulgated maximum contaminant levels (MCLs) for several PFAS compounds that are more stringent than the current DEC drinking water action levels. As of this writing, DEC has not yet changed their drinking water action level to match EPA's new MCLs; however, it is likely that DEC will align with EPA's PFAS MCLs in the future.

Additionally, we understand that concerns have been raised about potential contamination threatening the existing water supply well in Yakutat. We understand that that CBY is interested in determining a potential location for a future drinking water well in Yakutat.

1.2 Environmental Review Summary

We reviewed the DEC Contaminated Sites Database and identified two active contaminated sites that have potential to affect the project area (Figure 3):

- *DOT&PF Yakutat Airport Sitewide PFAS (DEC Hazard ID 27090, File Number 1530.38.022):*
Historic use of aqueous film forming foam at various locations at the Yakutat Airport has caused PFAS groundwater contamination in some water supply wells in the immediate vicinity of the airport. The extent of PFAS groundwater contamination or PFAS in soil near the airport is not fully defined. PFAS is mobile in groundwater and could be distributed downgradient from the airport to the project area.
- *DOT&PF Yakutat Airport Multiple Sites (DEC Hazard ID 25640, File Number 1530.38.018):*
Petroleum-contaminated soil has been discovered on state-owned property at the airport with no identified source, which prompted a 2012 Phase I Environmental Site Assessment (ESA) of 60 parcels at the Yakutat Airport. The Phase I ESA found that petroleum-impacted soil and groundwater at the airport may be widespread. The airport was a former Air Force Base during World War II and four formerly used defense sites are located within the airport boundary. In addition, there are many aboveground storage tanks, drums, floor drains with unknown discharge locations, a waste lagoon, and septic systems with unknown discharge destinations. The wide range of potential sources, documented and undocumented, presents a risk that the project may encounter previously unknown contamination.

Other nearby active contaminated sites are less likely to impact the project area but are included for completeness:

- *FAA Yakutat Bldg 607 (DEC Hazard ID 2377, File Number 1530.38.007):*
Petroleum and polychlorinated biphenyl (PCB) contamination from known and unknown releases is present at the Federal Aviation Administration (FAA) Building 607 near the Yakutat Airport. In 2010, a remedial action by Bethel Services Inc. excavated approximately 774 cubic yards of petroleum and PCB-contaminated soil from the former Building 607 location. During excavation they encountered areas with non-aqueous phase liquid (NAPL) fuel and/or oil on the groundwater table. They used sorbent booms to remove approximately 350 pounds of NAPL from groundwater entering the area of soil excavation; however, they observed that NAPL appeared to extend outside of the excavation area. The NAPL may be contaminated with PCBs. Diesel-contaminated soil remains in areas of the site. The petroleum and NAPL contamination is unlikely to migrate the distance from the source to the water line project area; however, the project area may be hydrologically downgradient from the FAA Bldg 607 site.
- *DOT&PF Yakutat Former Shop Building (DEC Hazard ID 25483, File Number 1530.38.017):*
During site characterization for the FAA Bldg 607 site, diesel-contaminated soil was encountered on the north side of the lot on the Alaska Department of Transportation

and Public Facilities (DOT&PF) Yakutat former shop building property. It was determined that the area of contamination was related to the DOT&PF former shop building. The petroleum contamination is unlikely to migrate due to distance from the area of contamination to the water line project area; however, the project may be downgradient from the DOT&PF former shop building.

- *NOAA NWS Former Employee Housing (DEC Hazard ID 27902, File Number 1530.38.024):*
A hazardous building materials survey for a residential six-plex in 2009 found lead in paint samples. In 2019, a limited site investigation to evaluate whether soil surrounding the building had been contaminated by the lead in paint found lead contamination around the building drip line at about six inches below ground surface up to 10,100 milligrams per kilogram (mg/kg). The residential six-plex and adjacent concrete walkways and utilities are planned to be demolished. The lead contamination is likely limited to shallow surface soil adjacent to the building where paint may have weathered off the building.
- *NOAA Yakutat Office (DEC Hazard ID 2972, File Number 1530.38.006):*
The site was used for launching weather balloons and had a single building with a 675-gallon diesel fuel underground storage tank (UST). The diesel was used to heat the building and to power a hydrogen gas generator until the UST was decommissioned in 1998. Soil samples were collected around the UST and were found to exceed DEC cleanup levels for diesel range organics (DRO). Some soil was subsequently excavated from around the UST but later soil borings found that DRO contamination remained in the area. Three monitoring wells were installed at the soil boring locations; DRO, benzene, toluene, ethylbenzene, and xylenes were detected in groundwater less than DEC cleanup levels.
- *Yakutat AFB State Disposal Site No.3 (DEC Hazard ID 26914, File Number 1530.38.011):*
A former World War II-era motor repair shop, oil sheds, and utility building were constructed at this location. The area was used as a disposal site for military debris. The area was later used by the FAA and DOT&PF as a shop area. DEC observed tar and visually contaminated surface soil in the vicinity of this location during a site visit in 2018.

Based on the above information, the contaminants of potential concern (COPCs) for the water line extension project include the following:

- Gasoline range organics (GRO)
- DRO
- Residual range organics (RRO)
- Volatile organic compounds (VOCs)
- Polycyclic aromatic hydrocarbons (PAHs)

- PFAS
- Lead
- PCBs (in NAPL-only)

1.3 Environmental Scope of Services

Shannon & Wilson's environmental scope of services consists of:

- Preparing the project-specific Sampling and Analysis Plan (SAP) and consulting with DEC to finalize the SAP;
- Securing a drilling subcontractor;
- Installing and sampling a temporary well point (TWP);
- Conducting a percolation test;
- Field screening and sampling soil during drilling activities;
- Quality-control field and laboratory testing of soils;
- Submitting a TWP drinking water sample to the laboratory for analytical testing;
- Submitting soil samples to the laboratory for analytical testing;
- Quality control field and analytical laboratory testing of soils and drinking water; and
- Preparing this summary report of the results of chemical analyses.

This project did not include an environmental site assessment, overall site characterization, nor delineation of contamination.

2 FIELD ACTIVITIES

Between December 4th and December 14th, Discovery Drilling (Discovery), a drilling subcontractor of Shannon & Wilson, advanced a total of 29 soil borings, designated Borings B-1 through B-29, related to the Project. One additional shallow boring for a percolation test designated PERC was advanced on December 9, 2024. In addition, one boring was converted to a TWP to collect samples for selected drinking water-quality parameters and PFAS. Refer to Figure 2 for approximate boring, PERC, and TWP locations.

We created field logs of the soil borings and collected representative soil and water samples for environmental laboratory analyses. Environmental screening, sampling methods, and laboratory samples were conducted in accordance with Shannon & Wilson's DEC-approved SAP and emailed correspondence with DEC for this project.

Shannon & Wilson field representatives Forrest Dobson and Lucas Woosley, QEPs per 18 AAC 75.333, field-screened the split-spoon samples and collected soil samples for environmental laboratory analyses. A Vicinity Map is presented in Figure 1, showing the approximate location of the project area. Figure 2 presents the approximate soil-boring locations. The soil-boring logs and the project field forms are presented in Appendix A and Appendix B, respectively.

2.1 Field, Exploration, and Drilling Methods

Drilling services for this project were provided by Discovery of Anchorage, Alaska, using a track-mounted Geoprobe 6712DT drill rig. A representative from our firm was present during drilling to locate the borings, observe drill action, collect geotechnical and environmental soil and water samples, log subsurface conditions, observe groundwater conditions, and perform a percolation test. We coordinated with the Call Locate Center and local authorities to clear the boring locations of buried public utilities prior to drilling.



Exhibit 1: Setting up drill rig on the roadside.

The Geoprobe 6712 DT is a track-mounted drill rig equipped with continuous-flight hollow-stem auger tooling. Sampling was conducted using split-spoon sampling technique. Borings were generally advanced to a depth of approximately 17 feet below ground surface (bgs). However, borings adjacent to Ophir Creek were advanced to approximately 32 feet bgs, and the boring at the proposed water well site was advanced to approximately 60 feet bgs. The shallow boring for the percolation test was advanced to approximately 1.6 feet bgs.

GeoTek collected the samples using a 3¼ -inch inner diameter split-spoon sampler consistent with procedures discussed in ASTM International D1586 Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils. The split-spoon samples were obtained by driving the sampler into the soil at the base of the auger using a 340-pound automatic hammer falling 30 inches onto the drill rods. Samples were recovered at 2.5-foot intervals for the first ten feet, and then at 5-foot intervals thereafter to the bottom of the boring. Refer to the geotechnical report, *Draft Geotechnical Engineering Report, Yakutat Airport Water Line Extension*, dated February 2025, for geotechnical findings.

2.2 Environmental Field Screening



Exhibit 2: Sheen observed in B-23 sample.

Environmental staff conducted field screening of the soil samples collected from above the groundwater table with a handheld Rae Systems, Inc. MiniRae 3000 photoionization detector (PID). Environmental staff calibrated the PID in accordance with our SAP. The PID is capable of detecting some volatile organic compounds but is not able to detect PFAS and other non-volatile compounds. Currently, there are no field-screening methods for PFAS analytes.

PID readings were less than the project action limit of ten parts per million (ppm) in all samples, except for one sample collected from boring B-23 at approximately 4-5 feet bgs, which had the highest PID reading of 26.7 ppm. In addition, that sample interval had an observable sheen, indicating potential petroleum contamination. Consequently, analytical samples for GRO, DRO, RRO, PAH, VOCs, PCBs, and lead were collected for B-23 at the depth interval with the potential petroleum contamination. Analytical samples for fuel COPCs were not collected from the remaining borings, as no PID results exceeded 10 ppm.

In accordance with the project-specific work plan, field staff also collected one analytical sample for PFAS analysis from each boring located within the Yakutat Airport Property boundary (borings B-20 through B-25; Figure 2). Analytical samples were collected and immediately stored in a temperature-controlled cooler that was securely maintained by Shannon & Wilson field staff.

Also, during the advancement of boring B-27 (located at the north side of Ophir Creek; Figure 2), Shannon & Wilson identified wood debris in samples collected between 2.5 – 7.5 feet bgs. These samples had PID readings below the project action level of 10 ppm. However, upon drying these samples at the Shannon & Wilson soils laboratory, a fuel odor was observed and documented. A review of the material from the Shannon & Wilson soils laboratory manager indicated that the wood debris was likely creosote-treated material.

Soil observations and PID field-screening results are included in the boring logs presented in Appendix A. Our observations are specific to the locations, depths, and dates noted on the logs, and may not be applicable to all areas of the site.

2.3 Drinking Water Sampling Collection

The drilling contractor installed a TWP at boring B-1 (Figure 2). The TWP was approximately 60.7 feet bgs, constructed of new 2-inch diameter PVC, and screened between 20-30-feet bgs. The TWP was installed in this manner to set the screened interval within a selected section of the borehole with relatively low sand and fines content. The TWP was sampled on December 10th using a submersible, stainless steel GeoSub Hurricane pump. Three well volumes were purged prior to sample collection and field parameters were not required.



Exhibit 3: Sampling setup at the B-1 TWP.

The analytical sample was collected and immediately stored in a temperature-controlled cooler that was securely maintained by Shannon & Wilson field staff. Upon completion of the sampling, Discovery removed the TWP. Following TWP removal, the borehole was backfilled with cuttings to 30 feet bgs, pea gravel to 15 feet bgs, and bentonite chips to ground surface.

2.4 Environmental Analytical Testing

Environmental field logs including sample locations and field-screening results are included in Appendices A and B. Analytical results are discussed in Section 3. The three Eurofins laboratory reports and associated Laboratory Data Review Checklists (LDRCs) are included in Appendices C, D, and E.

2.4.1 Soil Borings

Based on the available information and field observations, we submitted the soil sample from boring B-23 for analysis of the following methods:

- GRO by AK101
- DRO by AK102
- RRO by AK103
- VOCs by SW8260D
- Low-level VOCs by SW8260D-SIM and SW8011
- PAHs by SW8270E-SIM
- PCBs by SW8082A
- Lead by SW6020B

In addition, borings B-20, B-21, B-22, B-23, B-24, and B-25 which were advanced within the airport property boundary were sampled for PFAS by EPA Method 537 Modified, as detailed in our approved work plan.

Samples were placed in laboratory-supplied jars, labeled, sealed, and placed in a cooler for transportation. PFAS samples were shipped via FedEx to Eurofins Environment Testing (Eurofins) laboratory in West Sacramento, California, and reported under work order (WO) 320-117793-1 (Appendix C). The remaining samples were shipped via Alaska Airlines Goldstreak to the Eurofins laboratory in Tacoma, Washington, and reported under WO 580-146688-1 (Appendix D). The laboratories used are DEC and Department of Defense certified for the requested analyses.

2.4.2 Drinking Water

The drinking water sample collected from the TWP at the B-1 location was submitted for the following analyses:

- VOCs by EPA 524.2
- Total metals by EPA 200.7/ 200.8
- Dissolved iron and manganese by EPA 200.7/ 200.8
- Mercury by EPA 245.1
- Hardness as calcium carbonate (CaCO_3) by Standard Method 2340B
- Total alkalinity as CaCO_3 by Standard Method 2320B
- Nitrate and nitrite by EPA 353.2
- Fluoride by Standard Method 4500 F C
- Cyanide by EPA 335.4
- Chloride and sulfate by EPA 300.0
- pH by EPA 150.1
- Total dissolved solids (TDS) by Standard Method 2540C
- True color by Standard Method 2120B
- Langelier index by Standard Method 2330B
- E. coli and total coliform by Standard Method 9223B
- PFAS by EPA 1633

Samples were placed in laboratory-supplied jars, labeled, sealed, and placed in a cooler for transportation. PFAS samples were shipped via FedEx to Eurofins laboratory in West Sacramento, California, and reported under WO 320-117793-1 (Appendix C). The remaining

samples were shipped via Alaska Airlines Goldstreak to Eurofins Eaton Analytical, LLC in South Bend, Indiana, and reported under WO 810-131289-1 (Appendix E). The laboratories used are DEC and Department of Defense certified for the requested analyses.

2.5 Investigation Derived Waste

Investigation-derived waste consisted of disposable sampling equipment (nitrile gloves, paper towels, sorbent pads, plastic bags, etc.) which we disposed of at the Yakutat landfill as inert solid waste. Soil drill cuttings were used to backfill the borings from which they were generated. Decontamination rinse water was disposed of to the ground surface near the soil boring locations and at least 100 feet from drinking water wells and surface water. Purge water from boring B-1 was discharged to the ground surface near the soil boring location and at least 100 feet from drinking water wells and surface water.

3 DEVIATIONS FROM THE WORK PLAN

In general, we conducted our services in accordance with the work plan and email correspondence with DEC, except for the following deviations.

- The work plan described advancing eight borings at the airport at proposed locations. Due to utility conflicts, several borings were moved and only six borings were advanced at the airport.
- Field duplicate soil samples were inadvertently not collected at the frequency outlined in the work plan. Per the work plan, field duplicate soil samples should have been collected at a frequency of 10% of the samples submitted per analysis. No field duplicate soil sample was collected. The overall data quality was not affected, and data precision can be evaluated using the precision calculated for the laboratory control samples and laboratory control sample duplicate.

4 ANALYTICAL RESULTS

Analytical sample quality assurance and quality control measures are summarized in Appendix F. Several samples were affected by quality control failures, and the affected results may have some degree of uncertainty. Analytical results with quality control failures are flagged in the summary tables and data quality and usability are presented in Appendix F. We cannot offer an opinion on the presence or absence of contaminants at locations we did not sample.

4.1 Soil Samples

To evaluate soil analytical data, we compared the sample results to the most stringent values between the DEC cleanup levels in 18 AAC 75.341 Table B1 and B2 Method Two (Migration to Groundwater or Over 40 Inch Zone Human Health). The most stringent value of the DEC cleanup levels is used as the project action limit for a given analyte.

The analytical results showed detections for GRO, DRO, eight VOCs, two PAHs, two PFAS (including perfluorooctanesulfonic acid [PFOS]), and lead in one or more sample. Analytical results were below the applicable DEC soil regulatory limits, with the exception of GRO, DRO, 1,1,2-trichloroethane, 1,2-dibromoethane, 2-hexanone, and naphthalene. The analytical soil results are summarized in Table 1.

4.2 Drinking Water Sample

To evaluate drinking water analytical data, we compared results to the EPA's Title 40 of the Code of Federal Regulations Part (CFR) 141 MCLs and Title 40 CFR 143 Secondary Maximum Contaminant Levels (SMCLs), in order of hierarchy.

The analytical results showed detections for three PFAS, twelve total metals, two dissolved metals, nitrite, chloride, and sulfate. The results reported results for hardness as CaCO_3 , total alkalinity as CaCO_3 , pH, TDS, and Langelier index. The results were below the EPA MCLs. However, the analytes total iron, aluminum, dissolved manganese, and total manganese exceeded the SMCLs. The analytical drinking water results are summarized in Table 2.

5 CONCLUSIONS

Shannon & Wilson's environmental staff field screened and sampled soils collected from borings advanced along the proposed Yakutat Waterline Extension. Results of the field screening identified one location (boring B-23) with potential fuel contamination, which was located within the Yakutat Airport property boundary. Analytical samples collected from this boring location confirmed the presence of several fuel related and chlorinated solvent compounds at concentrations exceeding the most stringent DEC Soil Cleanup Levels. Additionally, creosote-treated wood debris was encountered at B-27, although PID results were below project action levels during field screening. Soils and debris adjacent to borings B-23 and B-27 will require special handling during the construction phase of the project in the vicinity of these boring locations.

Also, Shannon & Wilson identified three boring locations within the Yakutat Airport property boundary that had detections for PFAS analytes. While these detections are less than the DEC Soil Cleanup Levels, Shannon & Wilson's previous experience with related PFAS projects in Yakutat and around the state suggest that the soils from these areas will also require special handling during the construction phase of the project.

Shannon & Wilson staff collected a water sample from the TWP installed in soil boring B-1. These samples were collected for select drinking water parameters and PFAS analytes to assess if this location would be suitable for installation of an alternative water-supply well for the water distribution system. The analytical results identified that aluminum, iron (total), and manganese (dissolved and total) exceeded their respective SMCLs.

6 RECOMMENDATIONS

Due to detectable concentrations of PFAS and volatile analytes in the soil samples collected from within the Yakutat Airport property boundary, special soil-handling considerations will need to be addressed during construction. As part of Shannon & Wilson's scope for this project, we will use this information to develop recommendations for special soil-handling which will be outlined in the Construction Materials Management Plan, which is being drafted concurrently to this report.

In addition, a Well Siting Study is in the process of being developed by Shannon & Wilson in association with a related CBY project. The results from the TWP sample collected during this exploration phase will be evaluated and discussed along with several other options for an alternative water-supply source for this distribution system. The Well Siting Study is also being drafted concurrently to this report.

7 CLOSURE

We have prepared the environmental report for this project based on:

- The limitations of our approved scope, schedule, and budget described in our proposals dated March 19, 2024; July 17, 2024; and September 25, 2024.
- Our understanding of the project and information provided by RESPEC.
- Site and subsurface conditions we observed during our site visits and in the boring locations as they existed during our subsurface explorations.
- The results of analytical testing performed on samples we collected from the borings.

When the designer develops additional information about final design, the recommendations presented herein may need to be revised. Shannon & Wilson should be made aware of the revised or additional information so that we can revise our recommendations as necessary.

8 REFERENCES

- Alaska Department of Environmental Conservation, October 2023, 18 AAC 75: *Oil and Other Hazardous Substances Pollution Control*: Juneau, Alaska, available: <http://dec.alaska.gov/commish/regulations/>.
- Environmental Protection Agency, last updated December 12, 2024, 40 CFR 141: *National Primary Drinking Water Regulations*, available: www.ecfr.gov
- Environmental Protection Agency, last updated January 28, 2025, 40 CFR 143: *Other Safe Drinking Water Act Regulations*, available: www.ecfr.gov
- Shannon & Wilson, Inc., August 2024, *Yakutat Airport Water Line Extension Final Exploration Phase – Sampling and Analysis Plan*.

Table 1 — Soil Boring Results

Analytical Method	Analyte	CAS#	Regulatory Limit	Units	B-20	B-21	B-22	B-23	B-24	B-25
					12/11/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024
AK101	Gasoline Range Organics	8006-61-9	260	mg/kg	—	—	—	270	—	—
AK102 & 103	Diesel Range Organics	STL00258	230	mg/kg	—	—	—	1000	—	—
	Residual Range Organics	STL00383	9700	mg/kg	—	—	—	<29.0	—	—
SW8260D (VOCs)	1,1,1-Trichloroethane	71-55-6	32	mg/kg	—	—	—	<0.00590	—	—
	1,1-Dichloroethane	75-34-3	0.092	mg/kg	—	—	—	<0.0120	—	—
	1,1-Dichloropropene	563-58-6	N/A	mg/kg	—	—	—	<0.00590	—	—
	1,2,3-Trichlorobenzene	87-61-6	0.15	mg/kg	—	—	—	<0.0290	—	—
	1,2,3-Trichloropropane	96-18-4	0.000031	mg/kg	—	—	—	<0.0120	—	—
	1,2,4-Trichlorobenzene	120-82-1	0.082	mg/kg	—	—	—	<0.0290	—	—
	1,2,4-Trimethylbenzene	95-63-6	0.61	mg/kg	—	—	—	<0.0120	—	—
	1,2-Dibromo-3-chloropropane	96-12-8	N/A	mg/kg	—	—	—	<0.0120	—	—
	1,2-Dichlorobenzene	95-50-1	2.4	mg/kg	—	—	—	<0.0120	—	—
	1,2-Dichloropropane	78-87-5	0.03	mg/kg	—	—	—	<0.00590	—	—
	1,3,5-Trimethylbenzene	108-67-8	0.66	mg/kg	—	—	—	<0.0120	—	—
	1,3-Dichlorobenzene	541-73-1	2.3	mg/kg	—	—	—	<0.0120	—	—
	1,3-Dichloropropane	142-28-9	N/A	mg/kg	—	—	—	<0.00590	—	—
	2,2-Dichloropropane	594-20-7	N/A	mg/kg	—	—	—	<0.0120	—	—
	2-Butanone (MEK)	78-93-3	15	mg/kg	—	—	—	<0.0590	—	—
	2-Chlorotoluene	95-49-8	N/A	mg/kg	—	—	—	<0.0120	—	—
	4-Chlorotoluene	106-43-4	N/A	mg/kg	—	—	—	<0.0120	—	—
	Acetone	67-64-1	38	mg/kg	—	—	—	<0.200 J*	—	—
	Bromobenzene	108-86-1	0.36	mg/kg	—	—	—	<0.00590	—	—
	Bromochloromethane	74-97-5	N/A	mg/kg	—	—	—	<0.00590	—	—
	Carbon disulfide	75-15-0	2.9	mg/kg	—	—	—	0.0110 J	—	—
	Carbon tetrachloride	56-23-5	0.021	mg/kg	—	—	—	<0.00590	—	—
	Chlorobenzene	108-90-7	0.46	mg/kg	—	—	—	<0.00590	—	—
	Chloroethane	75-00-3	72	mg/kg	—	—	—	<0.0290	—	—
	Chloromethane	74-87-3	0.61	mg/kg	—	—	—	<0.0120	—	—
	cis-1,2-Dichloroethene	156-59-2	0.12	mg/kg	—	—	—	<0.0120	—	—
	Dichlorodifluoromethane (Freon 12)	75-71-8	3.9	mg/kg	—	—	—	<0.0390	—	—
	Ethylbenzene	100-41-4	0.13	mg/kg	—	—	—	<0.0120	—	—

Table 1 — Soil Boring Results

Analytical Method	Analyte	CAS#	Regulatory Limit	Units	B-20	B-21	B-22	B-23	B-24	B-25
					12/11/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024
SW8260D (VOCs)	Isopropylbenzene	98-82-8	5.6	mg/kg	—	—	—	<0.0120	—	—
	Methyl isobutyl ketone	108-10-1	18	mg/kg	—	—	—	<0.0290	—	—
	Methylene chloride	75-09-2	0.33	mg/kg	—	—	—	<0.0390	—	—
	Methyl-t-butyl ether (MTBE)	1634-04-4	0.4	mg/kg	—	—	—	<0.00590	—	—
	n-Butylbenzene	104-51-8	23	mg/kg	—	—	—	<0.0120	—	—
	n-Propylbenzene	103-65-1	9.1	mg/kg	—	—	—	<0.0120	—	—
	o-Xylene	95-47-6	1.5	mg/kg	—	—	—	<0.00590	—	—
	p-Isopropyltoluene	99-87-6	N/A	mg/kg	—	—	—	<0.0120	—	—
	sec-Butylbenzene	135-98-8	42	mg/kg	—	—	—	<0.0120	—	—
	Styrene	100-42-5	10	mg/kg	—	—	—	<0.0120	—	—
	tert-Butylbenzene	98-06-6	11	mg/kg	—	—	—	<0.0120	—	—
	Toluene	108-88-3	6.7	mg/kg	—	—	—	<0.0120	—	—
	trans-1,2-Dichloroethene	156-60-5	1.3	mg/kg	—	—	—	<0.0120	—	—
	Trichlorofluoromethane (Freon 11)	75-69-4	41	mg/kg	—	—	—	<0.0290	—	—
	m,p-Xylene	179601-23-1	N/A	mg/kg	—	—	—	<0.00590	—	—
SW8260D SIM (LL VOCs)	1,1,1,2-Tetrachloroethane	630-20-6	0.022	mg/kg	—	—	—	<0.000980	—	—
	1,1,2,2-Tetrachloroethane	79-34-5	0.003	mg/kg	—	—	—	<0.000980	—	—
	1,1,2-Trichloroethane	79-00-5	0.0014	mg/kg	—	—	—	0.260	—	—
	1,1-Dichloroethene	75-35-4	1.2	mg/kg	—	—	—	0.000310 J	—	—
	1,2-Dibromoethane	106-93-4	0.00024	mg/kg	—	—	—	0.00420 JH*	—	—
	1,2-Dichloroethane	107-06-2	0.0055	mg/kg	—	—	—	<0.000980	—	—
	1,4-Dichlorobenzene	106-46-7	0.037	mg/kg	—	—	—	<0.000980	—	—
	2-Hexanone	591-78-6	0.11	mg/kg	—	—	—	0.220	—	—
	Benzene	71-43-2	0.022	mg/kg	—	—	—	0.000830 J	—	—
	Bromodichloromethane	75-27-4	0.0043	mg/kg	—	—	—	<0.000490	—	—
	Bromoform	75-25-2	0.1	mg/kg	—	—	—	<0.000980	—	—
	Bromomethane	74-83-9	0.024	mg/kg	—	—	—	<0.000980	—	—
	Chloroform	67-66-3	0.0071	mg/kg	—	—	—	0.000440 J	—	—
	cis-1,3-Dichloropropene	10061-01-5	0.018	mg/kg	—	—	—	<0.000980	—	—
	Dibromochloromethane	124-48-1	0.0027	mg/kg	—	—	—	<0.000490	—	—
	Dibromomethane	74-95-3	0.025	mg/kg	—	—	—	<0.00200 B*	—	—

Table 1 — Soil Boring Results

Analytical Method	Analyte	CAS#	Regulatory Limit	Units	B-20	B-21	B-22	B-23	B-24	B-25
					12/11/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024
SW8260D SIM (LL VOCs)	Hexachlorobutadiene	87-68-3	0.02	mg/kg	—	—	—	<0.00200	—	—
	Naphthalene	91-20-3	0.038	mg/kg	—	—	—	<0.00200 J*	—	—
	Tetrachloroethene	127-18-4	0.19	mg/kg	—	—	—	<0.00200 B*	—	—
	trans-1,3-Dichloropropene	10061-02-6	0.018	mg/kg	—	—	—	0.000400 J	—	—
	Trichloroethene	79-01-6	0.011	mg/kg	—	—	—	<0.00200 B*	—	—
	Vinyl chloride	75-01-4	0.0008	mg/kg	—	—	—	<0.00200 J*	—	—
SW8011 (LL VOCs)	1,2,3-Trichloropropane	96-18-4	0.000031	mg/kg	—	—	—	<0.000160	—	—
	1,2-Dibromoethane	106-93-4	0.00024	mg/kg	—	—	—	<0.0000390	—	—
SW8270E SIM (PAHs)	1-Methylnaphthalene	90-12-0	0.41	mg/kg	—	—	—	<0.00480	—	—
	2-Methylnaphthalene	91-57-6	1.3	mg/kg	—	—	—	<0.00480	—	—
	Acenaphthene	83-32-9	37	mg/kg	—	—	—	<0.00480	—	—
	Acenaphthylene	208-96-8	18	mg/kg	—	—	—	<0.00480	—	—
	Anthracene	120-12-7	390	mg/kg	—	—	—	<0.00480	—	—
	Benzo(a)anthracene	56-55-3	0.7	mg/kg	—	—	—	<0.00480	—	—
	Benzo(a)pyrene	50-32-8	1.5†	mg/kg	—	—	—	<0.00480	—	—
	Benzo(b)fluoranthene	205-99-2	15†	mg/kg	—	—	—	<0.00290	—	—
	Benzo(g,h,i)perylene	191-24-2	2300†	mg/kg	—	—	—	<0.00480	—	—
	Benzo(k)fluoranthene	207-08-9	150†	mg/kg	—	—	—	<0.00480	—	—
	Chrysene	218-01-9	600	mg/kg	—	—	—	<0.00290	—	—
	Dibenzo(a,h)anthracene	53-70-3	1.2†	mg/kg	—	—	—	<0.00480	—	—
	Fluoranthene	206-44-0	590	mg/kg	—	—	—	<0.00290	—	—
	Fluorene	86-73-7	36	mg/kg	—	—	—	<0.00480	—	—
	Indeno(1,2,3-cd)pyrene	193-39-5	12†	mg/kg	—	—	—	<0.00480	—	—
	Naphthalene	91-20-3	0.038	mg/kg	—	—	—	0.0680	—	—
	Phenanthrene	85-01-8	39	mg/kg	—	—	—	<0.00380	—	—
	Pyrene	129-00-0	87	mg/kg	—	—	—	0.00340 J	—	—
SW8082A (PCBs)	Aroclor-1016	12674-11-2	1.0 total †	mg/Kg	—	—	—	<0.0170	—	—
	Aroclor-1221	11104-28-2		mg/Kg	—	—	—	<0.0190	—	—
	Aroclor-1232	11141-16-5		mg/Kg	—	—	—	<0.0170	—	—
	Aroclor-1242	53469-21-9		mg/Kg	—	—	—	<0.0170	—	—
	Aroclor-1248	12672-29-6		mg/Kg	—	—	—	<0.0170	—	—

Table 1 — Soil Boring Results

Analytical Method	Analyte	CAS#	Regulatory Limit	Units	B-20	B-21	B-22	B-23	B-24	B-25
					12/11/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024	12/12/2024
SW8082A (PCBs)	Aroclor-1254	11097-69-1	1.0 total †	mg/Kg	—	—	—	<0.0190	—	—
	Aroclor-1260	11096-82-5		mg/Kg	—	—	—	<0.0170	—	—
EPA 537 Mod (PFAS)	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	3.0	µg/kg	<0.230	0.290	0.420	<0.220	0.290	<0.240
	Perfluorooctanoic acid (PFOA)	335-67-1	1.7	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorobutanesulfonic acid (PFBS)	375-73-5	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorodecanoic acid (PFDA)	335-76-2	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorododecanoic acid (PFDoA)	307-55-1	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluoroheptanoic acid (PFHpA)	375-85-9	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	N/A	µg/kg	<0.230	<0.230	0.0930 J*	<0.220	<0.220	<0.240
	Perfluorohexanoic acid (PFHxA)	307-24-4	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorononanoic acid (PFNA)	375-95-1	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorotetradecanoic acid (PFTeA)	376-06-7	N/A	µg/kg	<0.230 J*	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	Perfluoroundecanoic acid (PFUnA)	2058-94-8	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	2991-50-6	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	2355-31-9	N/A	µg/kg	<0.230	<0.230	<0.230	<0.220	<0.220	<0.240
SW6020B	Lead	7439-92-1	400†	mg/Kg	—	—	—	2.80	—	—

- Notes:
- Results reported from Eurofins Seattle work order 580-146688-1.
- Regulatory limits from 18 AAC 75.341 Table B1 Method Two - Soil Cleanup Levels Table (Migration to Groundwater), unless otherwise specified.
- † Regulatory limits from 18 AAC 75.341 Table B1 Method Two - Over 40 Inch Zone – Human Health Value.
- N/A No applicable regulatory limit exists for the associated analyte.
- The associated analyte was not reported for this sample.
- < Analyte not detected; listed as less than the limit of detection unless otherwise flagged due to quality-control failures.
- <Bold The laboratory's reporting limit LOD exceeds the regulatory limit.
- Bold** The detected concentration exceeds the regulatory limit for the associated analyte.
- J Estimated concentration, detected greater than the detection limit (DL) and less than the LOQ. Flag applied by the laboratory.
- B* Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc. (*)
- J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)
- JH* Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

CAS # = Chemical Abstract Service Number; EPA = Environmental Protection Agency; LL = low level; µg/kg = microgram per kilogram; mg/kg = milligram per kilogram; PAHs = polynuclear aromatic hydrocarbons; PCB = polychlorinated biphenyls; PFAS = per- and polyfluoroalkyl substance; VOC = volatile organic compounds

Table 2 — Drinking Water Results

Analytical Method	Analyte	CAS	Drinking Water Standards		Units	B-1
			MCL	SMCL		12/10/2024
EPA 524.2 (VOCs)	1,1,1,2-Tetrachloroethane	630-20-6	-	-	µg/L	<0.50
	1,1,1-Trichloroethane	71-55-6	200	-	µg/L	<0.50
	1,1,2,2-Tetrachloroethane	79-34-5	-	-	µg/L	<0.50
	1,1,2-Trichloroethane	79-00-5	5	-	µg/L	<0.50
	1,1-Dichloroethane	75-34-3	-	-	µg/L	<0.50
	1,1-Dichloroethene	75-35-4	7	-	µg/L	<0.50
	1,1-Dichloropropene	563-58-6	-	-	µg/L	<0.50
	1,2,3-Trichlorobenzene	87-61-6	-	-	µg/L	<0.50
	1,2,3-Trichloropropane	96-18-4	-	-	µg/L	<0.50
	1,2,4-Trichlorobenzene	120-82-1	70	-	µg/L	<0.50
	1,2,4-Trimethylbenzene	95-63-6	-	-	µg/L	<0.50
	1,2-Dibromo-3-chloropropane	96-12-8	0.2	-	µg/L	<0.20
	1,2-Dibromoethane	106-93-4	0.05	-	µg/L	<0.20
	1,2-Dichlorobenzene	95-50-1	600	-	µg/L	<0.50
	1,2-Dichloroethane	107-06-2	5	-	µg/L	<0.50
	1,2-Dichloropropane	78-87-5	5	-	µg/L	<0.25
	1,3,5-Trimethylbenzene	108-67-8	-	-	µg/L	<0.50
	1,3-Dichlorobenzene	541-73-1	-	-	µg/L	<0.50
	1,3-Dichloropropane	142-28-9	-	-	µg/L	<0.50
	1,4-Dichlorobenzene	106-46-7	75	-	µg/L	<0.50
	2,2-Dichloropropane	594-20-7	-	-	µg/L	<0.50
	2-Chlorotoluene	95-49-8	-	-	µg/L	<0.50
	4-Chlorotoluene	106-43-4	-	-	µg/L	<0.50
	Benzene	71-43-2	5	-	µg/L	<0.50
	Bromobenzene	108-86-1	-	-	µg/L	<0.50
	Bromochloromethane	74-97-5	-	-	µg/L	<0.50
	Bromodichloromethane	75-27-4	80	-	µg/L	<0.50
	Bromoform	75-25-2	80	-	µg/L	<0.50
	Bromomethane	74-83-9	-	-	µg/L	<0.50
	Carbon tetrachloride	56-23-5	5	-	µg/L	<0.50
	Chlorobenzene	108-90-7	100	-	µg/L	<0.50

Table 2 — Drinking Water Results

Analytical Method	Analyte	CAS	Drinking Water Standards		Units	B-1
			MCL	SMCL		12/10/2024
EPA 524.2 (VOCs)	Chloroethane	75-00-3	-	-	µg/L	<0.50
	Chloroform	67-66-3	80	-	µg/L	<0.50
	Chloromethane	74-87-3	-	-	µg/L	<0.50
	cis-1,2-Dichloroethene	156-59-2	70	-	µg/L	<0.50
	cis-1,3-Dichloropropene	10061-01-5	-	-	µg/L	<0.50
	Dibromochloromethane	124-48-1	80	-	µg/L	<0.50
	Dibromomethane	74-95-3	-	-	µg/L	<0.50
	Dichlorodifluoromethane (Freon 12)	75-71-8	-	-	µg/L	<0.50
	Ethylbenzene	100-41-4	700	-	µg/L	<0.50
	Hexachlorobutadiene	87-68-3	-	-	µg/L	<0.25
	Isopropylbenzene	98-82-8	-	-	µg/L	<0.25
	m,p-Xylene	179601-23-1	-	-	µg/L	<0.50
	Methylene chloride	75-09-2	5	-	µg/L	<0.50
	Methyl-t-butyl ether (MTBE)	1634-04-4	-	-	µg/L	<0.50
	Naphthalene	91-20-3	-	-	µg/L	<0.50
	n-Butylbenzene	104-51-8	-	-	µg/L	<0.50
	n-Propylbenzene	103-65-1	-	-	µg/L	<0.50
	o-Xylene	95-47-6	-	-	µg/L	<0.50
	p-Isopropyltoluene	99-87-6	-	-	µg/L	<0.50
	sec-Butylbenzene	135-98-8	-	-	µg/L	<0.50
	Styrene	100-42-5	100	-	µg/L	<0.50
	tert-Butylbenzene	98-06-6	-	-	µg/L	<0.50
	Tetrachloroethene	127-18-4	5	-	µg/L	<0.50
	Toluene	108-88-3	1,000	-	µg/L	<0.50
	Total Xylenes	1330-20-7	10,000	-	µg/L	<0.50
	trans-1,2-Dichloroethene	156-60-5	100	-	µg/L	<0.50
	trans-1,3-Dichloropropene	10061-02-6	-	-	µg/L	<0.50
	Trichloroethene	79-01-6	5	-	µg/L	<0.50
	Trichlorofluoromethane (Freon 11)	75-69-4	-	-	µg/L	<0.50
	Vinyl chloride	75-01-4	2	-	µg/L	<0.20

Table 2 — Drinking Water Results

Analytical Method	Analyte	CAS	Drinking Water Standards		Units	B-1
			MCL	SMCL		12/10/2024
EPA 1633 (PFAS)	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	-	-	ng/L	<1.6
	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	1691-99-2	-	-	ng/L	<8.0
	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol (N-MeFOSE)	24448-09-7	-	-	ng/L	<8.0
	3-Perfluoroheptylpropanoic acid (7:3 FTCA)	812-70-4	-	-	ng/L	<8.0
	3-Perfluoropentylpropanoic acid (5:3 FTCA)	914637-49-3	-	-	ng/L	<8.0
	3-Perfluoropropylpropanoic acid (3:3 FTCA)	356-02-5	-	-	ng/L	<3.2
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	-	-	ng/L	<1.6
	4:2 FTS	757124-72-4	-	-	ng/L	<3.2
	6:2 FTS	27619-97-2	-	-	ng/L	<3.2
	8:2 FTS	39108-34-4	-	-	ng/L	<3.2
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	-	-	ng/L	<1.6
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	10	-	ng/L	<1.2
	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	2991-50-6	-	-	ng/L	<1.6
	N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	4151-50-2	-	-	ng/L	<1.6
	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	2355-31-9	-	-	ng/L	<1.6
	N-methylperfluoro-1-octanesulfonamide (N-MeFOSA)	31506-32-8	-	-	ng/L	<1.6
	Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	151772-58-6	-	-	ng/L	<1.6 J*
	Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	113507-82-7	-	-	ng/L	<1.6
	Perfluoro-3-Methoxypropanoic acid (PFMPA)	377-73-1	-	-	ng/L	<1.6
	Perfluoro-4-Methoxybutanoic Acid (PFMBA)	863090-89-5	-	-	ng/L	<1.6
	Perfluorobutanesulfonic acid (PFBS)	375-73-5	-	-	ng/L	<1.6
	Perfluorobutonic acid (PFBA)	375-22-4	-	-	ng/L	1.4 J
	Perfluorodecanesulfonic acid (PFDS)	335-77-3	-	-	ng/L	<1.6
	Perfluorodecanoic acid (PFDA)	335-76-2	-	-	ng/L	<1.6
	Perfluorododecane sulfonic acid (PFDoS)	79780-39-5	-	-	ng/L	<1.6
	Perfluorododecanoic acid (PFDoA)	307-55-1	-	-	ng/L	<1.6
	Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	-	-	ng/L	<1.6
	Perfluoroheptanoic acid (PFHpA)	375-85-9	-	-	ng/L	<1.6
	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	10	-	ng/L	1.0 J
	Perfluorohexanoic acid (PFHxA)	307-24-4	-	-	ng/L	<1.6
	Perfluorononanesulfonic acid (PFNS)	68259-12-1	-	-	ng/L	<1.6

Table 2 — Drinking Water Results

Analytical Method	Analyte	CAS	Drinking Water Standards		Units	B-1
			MCL	SMCL		12/10/2024
EPA 1633 (PFAS)	Perfluorononanoic acid (PFNA)	375-95-1	10	-	ng/L	<1.6
	Perfluorooctane sulfonamide (FOSA)	754-91-6	-	-	ng/L	<1.6
	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4.0	-	ng/L	<1.6
	Perfluorooctanoic acid (PFOA)	335-67-1	4.0	-	ng/L	0.47 J
	Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	-	-	ng/L	<1.6
	Perfluoropentanoic acid (PFPeA)	2706-90-3	-	-	ng/L	<1.6
	Perfluorotetradecanoic acid (PFTeA)	376-06-7	-	-	ng/L	<1.6
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8	-	-	ng/L	<1.6
	Perfluoroundecanoic acid (PFUnA)	2058-94-8	-	-	ng/L	<1.6
EPA 200.7	Calcium	7440-70-2	-	-	mg/L	57
	Iron - Dissolved	7439-89-6	-	0.3	mg/L	0.012
	Iron - Total	7439-89-6-T	-	0.3	mg/L	1.1
	Magnesium	7439-95-4	-	-	mg/L	4.3
	Potassium	7440-09-7	-	-	mg/L	2.6
	Sodium	7440-23-5	-	-	mg/L	3.4
EPA 200.8	Aluminum	7429-90-5	-	0.2	mg/L	0.96
	Antimony	7440-36-0	0.006	-	mg/L	<0.0010
	Arsenic	7440-38-2	0.010	-	mg/L	0.0017
	Barium	7440-39-3	2	-	mg/L	0.032
	Beryllium	7440-41-7	0.004	-	mg/L	<0.00030
	Cadmium	7440-43-9	0.005	-	mg/L	<0.00050
	Chromium	7440-47-3	0.1	-	mg/L	0.0032
	Copper	7440-50-8	1.3	1.0	mg/L	0.0055
	Manganese - Dissolved	7439-96-5	-	0.05	mg/L	0.12
	Manganese - Total	7439-96-5-T	-	0.05	mg/L	0.13
	Nickel	7440-02-0	-	-	mg/L	<0.0050
	Selenium	7782-49-2	0.05	-	mg/L	<0.0020
	Silver	7440-22-4	-	0.1	mg/L	<0.00050
	Thallium	7440-28-0	0.002	-	mg/L	<0.00030
EPA 245.1	Zinc	7440-66-6	-	5	mg/L	0.006
	Mercury	7439-97-6	0.002	-	mg/L	<0.00020

Table 2 — Drinking Water Results

Analytical Method	Analyte	CAS	Drinking Water Standards		Units	B-1
			MCL	SMCL		12/10/2024
SM 2340B	Calcium Hardness as CaCO3	STL00317	-	-	mg/L	140
SM 2320B	Total Alkalinity as CaCO3	STL00171	-	-	mg/L	140
EPA 353.2	Nitrate + Nitrite as N	STL00217	1	-	mg/L	<0.10 J*
	Nitrite as N	14797-65-0	1	-	mg/L	0.011 J*
Nitrate by calc	Nitrate as N	14797-55-8	10	-	mg/L	<0.10 J*
SM 4500 F C	Fluoride	16984-48-8	4.0	2.0	mg/L	<0.050
EPA 335.4	Cyanide	57-12-5	0.2	-	mg/L	<0.0050
EPA 300.0	Chloride	16887-00-6	-	250	mg/L	3.5
	Sulfate	14808-79-8	-	250	mg/L	7.1
EPA 150.1	pH	pH	-	6.5 - 8.5	su	7.6 J*
SM 2540C	Total Dissolved Solids	TDS	-	500	mg/L	19
SM 2120B	Color, True	Color	-	15	Color Units	<3.0
SM 2330B	Langelier Index	STL00247	-	-	LangSU	0.12
SM 9223B	Escherichia coli	68583-22-2	5.0%	-	None	Absent J*
	Total Coliform	STL00014	5.0%	-	None	Absent J*

Notes: Results reported from Euforins Environmental Testing work order 810-131289-1
Aside from PFAS, Drinking Water Standards were obtained from the EPAs 40 CFR 141 for MCLs and 40 CFR 143 for SMCLs.
PFAS Drinking Water Standards were obtained from the EPA PFAS National Primary Drinking Water Regulation dated April 2024.

- No applicable regulatory limit exists for the associated analyte.
- < Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control failures.

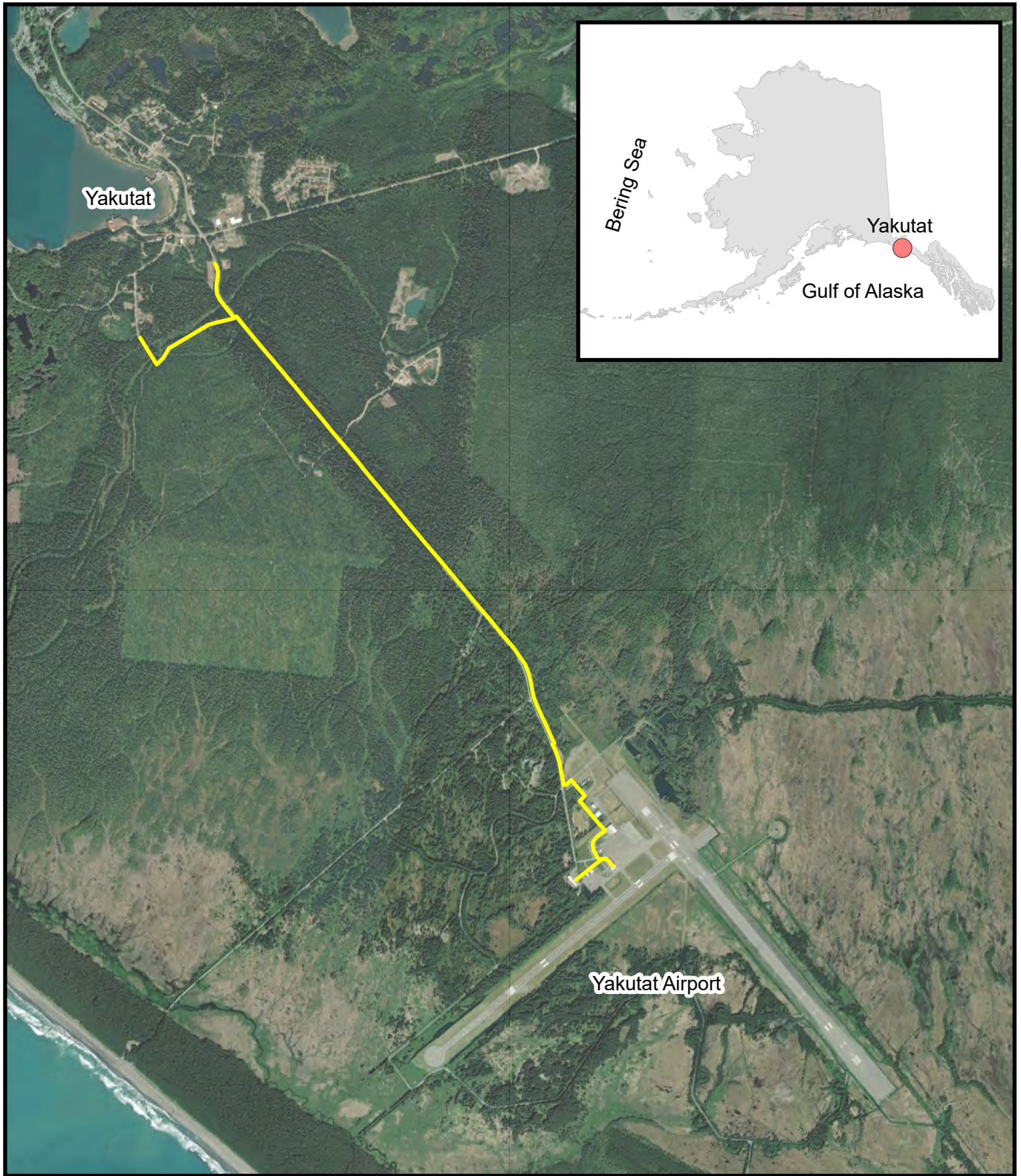
<Bold The laboratory's RL exceeds the regulatory limit.

Bold The detected concentration exceeds the regulatory limit for the associated analyte.

J Estimated concentration, detected greater than the detection limit (DL) and less than the reporting limit (RL). Flag applied by the laboratory.

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

CAS # = Chemical Abstract Service Number; EPA = Environmental Protection Agency; LangSU = Langelier standard units; MCL = Maximum Contaminant Level; µg/L = microgram per liter; mg/L = milligram per liter; ng/L = nanogram per liter; PFAS = per- and polyfluoroalkyl substance; SMCL = Secondary Maximum Contaminant Level; SU = standard unit; VOC = volatile organic compounds



LEGEND

— Proposed Waterline Alignment

0 0.5 1 1.5
Miles



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VICINITY MAP

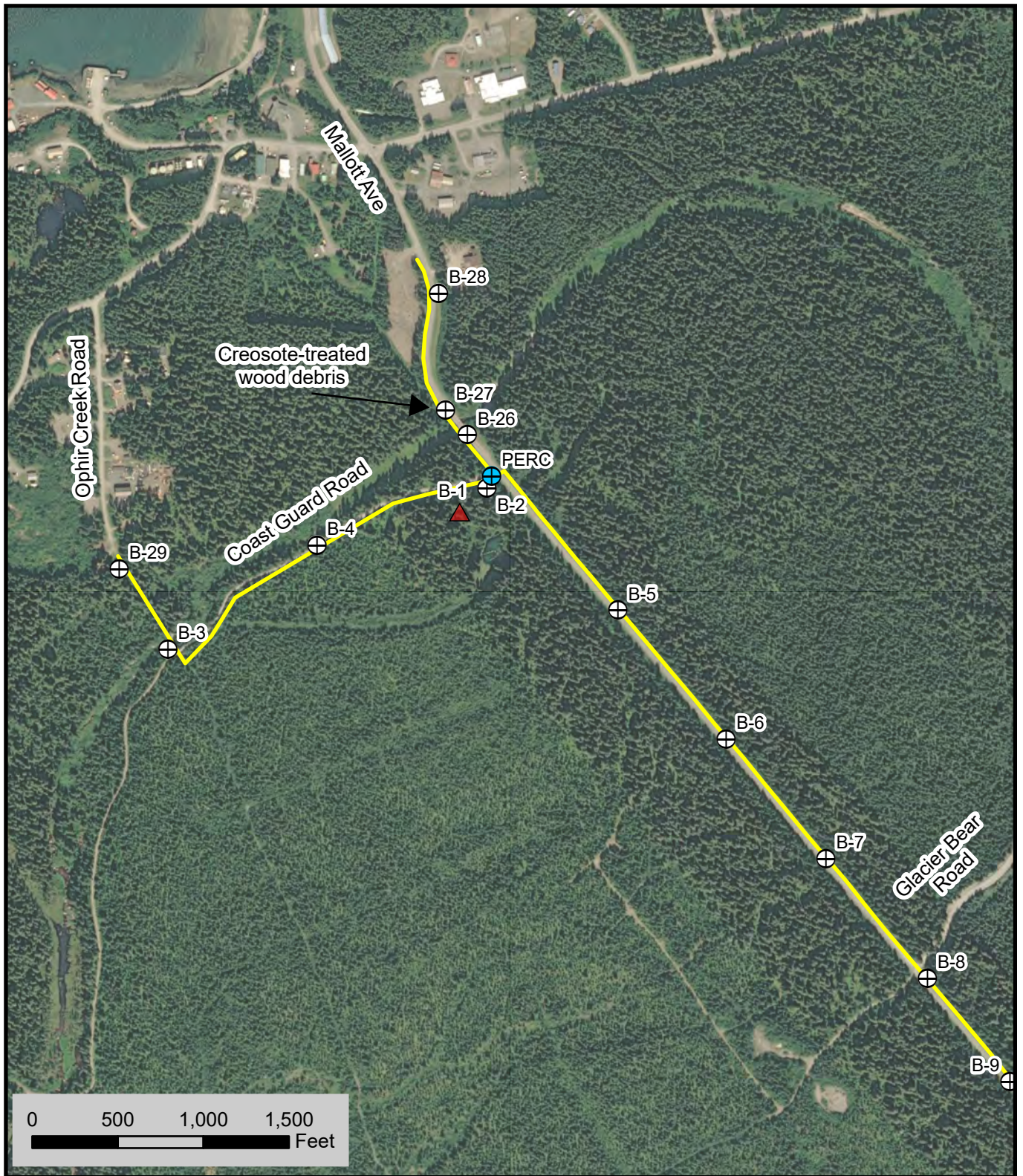
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Figure 1



LEGEND

- | | |
|--|---|
| — Proposed Waterline Alignment | ● VOCs Detected Above DEC CULs |
| Soil Boring Location | ▲ Temporary Well Point |
| ⊕ Soil Boring | ⊕ Percolation Test Performed |
| ⊕ PFOS Detected Below DEC Soil CUL | |

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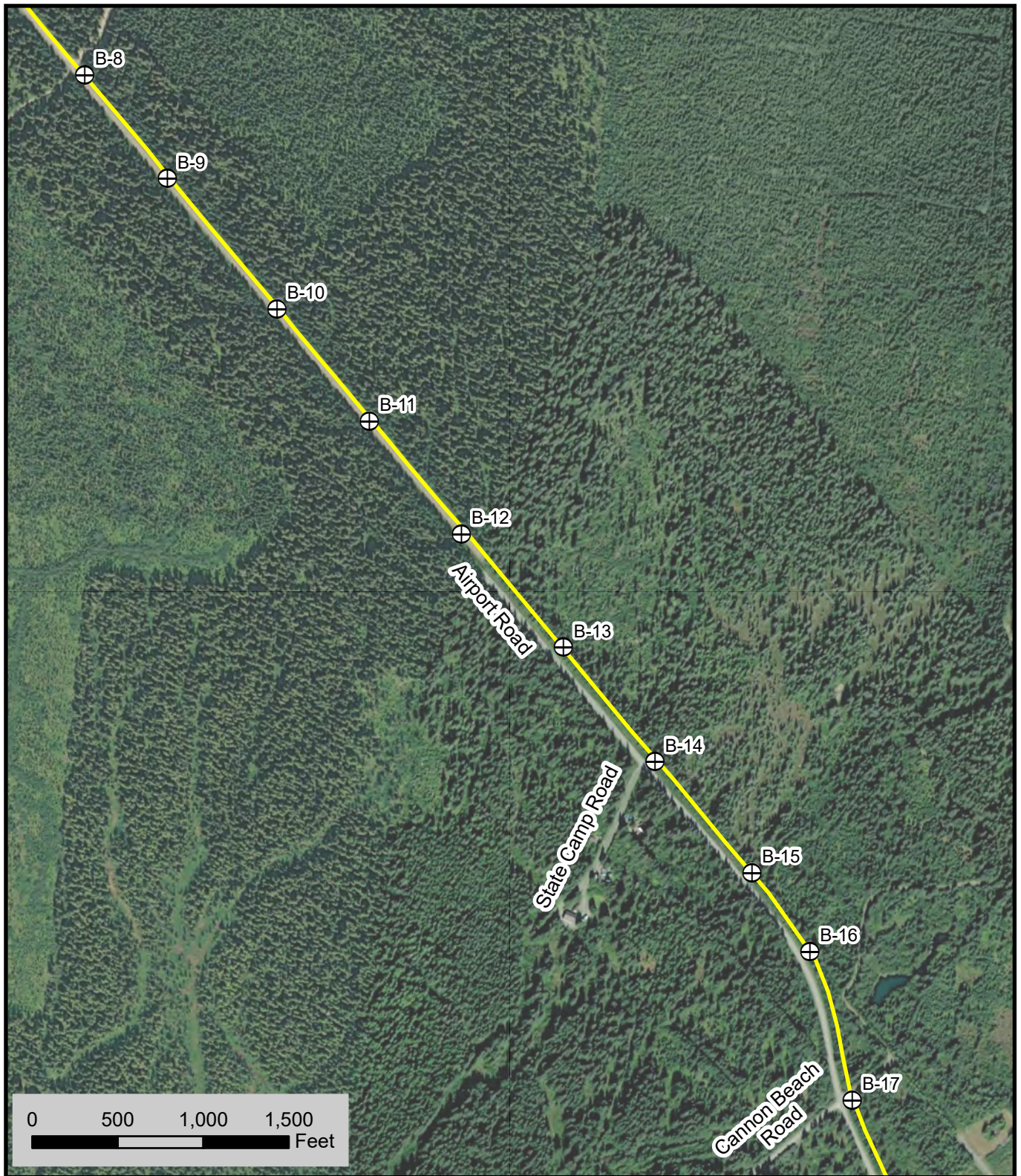
SITE PLAN

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Figure 2
Sheet 1 of 3



LEGEND

- | | |
|--|---|
| — Proposed Waterline Alignment | ● VOCs Detected Above DEC CULs |
| Soil Boring Location | ▲ Temporary Well Point |
| ⊕ Soil Boring | ⊕ Percolation Test Performed |
| ⊕ PFOS Detected Below DEC Soil CUL | |



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SITE PLAN

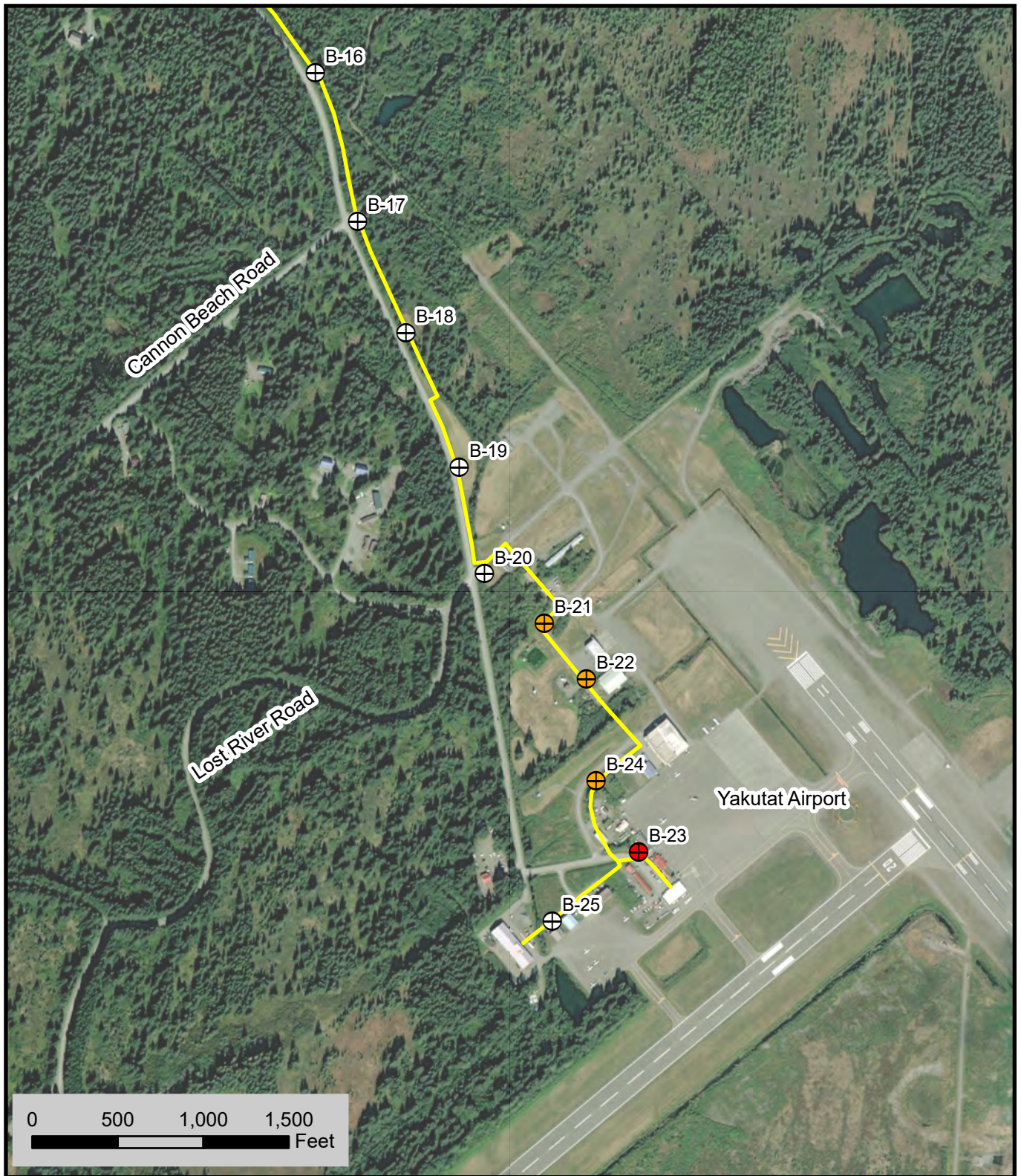
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Figure 2
Sheet 2 of 3



LEGEND

- | | |
|--|---|
| — Proposed Waterline Alignment | ⊕ VOCs Detected Above DEC CULs |
| Soil Boring Location | ▲ Temporary Well Point |
| ⊕ Soil Boring | ⊕ Percolation Test Performed |
| ⊕ PFOS Detected Below DEC Soil CUL | |



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SITE PLAN

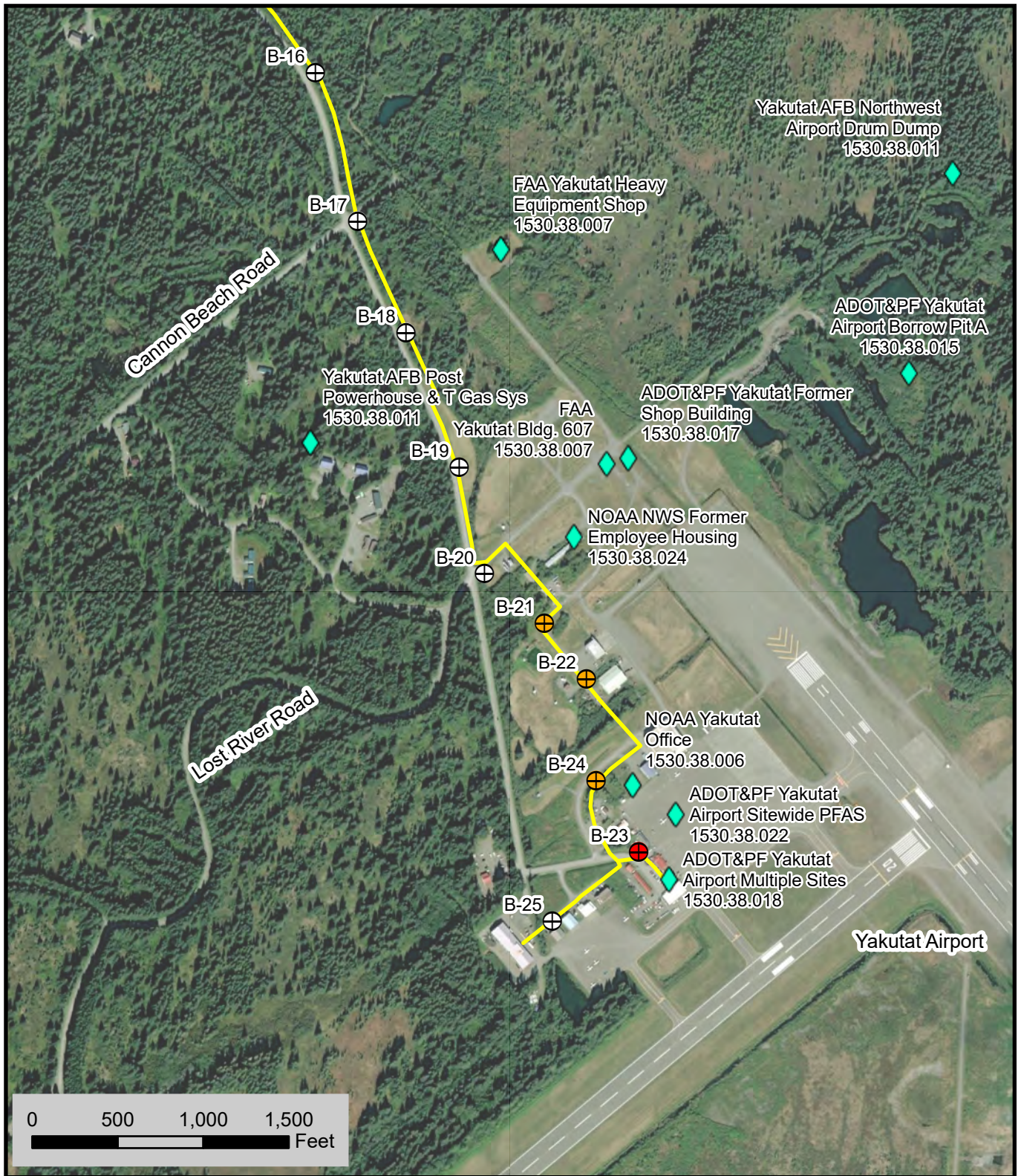
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Figure 2
Sheet 3 of 3



LEGEND

- | | |
|--|--|
| — Proposed Waterline Alignment | ⊕ Soil Boring Location |
| ◆ DEC Active Contaminated Site | ⊕ PFOS Detected Below DEC Soil CUL |
| | ⊕ VOCs Detected Above DEC CULs |

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CONTAMINATED SITES

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Figure 3

Appendix A

Boring Logs

CONTENTS

- Figure A-1 Soil Description and Log Key
- Figure A-2 Frost Classification Legend
- Figure A-3 through A-31: Boring Logs of Borings B-01 through B-29

APPENDIX A: BORING LOGS

Shannon & Wilson, Inc. (S&W), uses a soil identification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following pages. Soil descriptions are based on visual-manual procedures (ASTM D2488) and laboratory testing procedures (ASTM D2487), if performed.

S&W INORGANIC SOIL CONSTITUENT DEFINITIONS

CONSTITUENT ²	FINE-GRAINED SOILS (50% or more fines) ¹	COARSE-GRAINED SOILS (less than 50% fines) ¹
Major	Silt, Lean Clay, Elastic Silt, or Fat Clay³	Sand or Gravel⁴
Modifying (Secondary) Precedes major constituent	30% or more coarse-grained: Sandy or Gravelly⁴	More than 12% fine-grained: Silty or Clayey³
Minor Follows major constituent	15% to 30% coarse-grained: with Sand or with Gravel⁴ 30% or more total coarse-grained and lesser coarse-grained constituent is 15% or more: with Sand or with Gravel⁵	5% to 12% fine-grained: with Silt or with Clay³ 15% or more of a second coarse-grained constituent: with Sand or with Gravel⁵

¹All percentages are by weight of total specimen passing a 3-inch sieve.

²The order of terms is: *Modifying Major with Minor*.

³Determined based on behavior.

⁴Determined based on which constituent comprises a larger percentage.

⁵Whichever is the lesser constituent.

MOISTURE CONTENT TERMS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

STANDARD PENETRATION TEST (SPT) SPECIFICATIONS

Hammer:	140 pounds with a 30-inch free fall. Rope on 6- to 10-inch-diam. cathead 2-1/4 rope turns, > 100 rpm
	NOTE: If automatic hammers are used, blow counts shown on boring logs should be adjusted to account for efficiency of hammer.
Sampler:	10 to 30 inches long Shoe I.D. = 1.375 inches Barrel I.D. = 1.5 inches Barrel O.D. = 2 inches
N-Value:	Sum blow counts for second and third 6-inch increments. Refusal: 50 blows for 6 inches or less; 10 blows for 0 inches.
	NOTE: Penetration resistances (N-values) shown on boring logs are as recorded in the field and have not been corrected for hammer efficiency, overburden, or other factors.

PARTICLE SIZE DEFINITIONS

DESCRIPTION	SIEVE NUMBER AND/OR APPROXIMATE SIZE
FINES	< #200 (0.075 mm = 0.003 in.)
SAND Fine Medium Coarse	#200 to #40 (0.075 to 0.4 mm; 0.003 to 0.02 in.) #40 to #10 (0.4 to 2 mm; 0.02 to 0.08 in.) #10 to #4 (2 to 4.75 mm; 0.08 to 0.187 in.)
GRAVEL Fine Coarse	#4 to 3/4 in. (4.75 to 19 mm; 0.187 to 0.75 in.) 3/4 to 3 in. (19 to 76 mm)
COBBLES	3 to 12 in. (76 to 305 mm)
BOULDERS	> 12 in. (305 mm)

RELATIVE DENSITY / CONSISTENCY

COHESIONLESS SOILS		COHESIVE SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
< 4	Very loose	< 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
> 50	Very dense	15 - 30	Very stiff
		> 30	Hard

WELL AND BACKFILL SYMBOLS

	Bentonite Cement Grout		Surface Cement Seal
	Bentonite Grout		Asphalt or Cap
	Bentonite Chips		Slough
	Silica Sand		Inclinometer or Non-perforated Casing
	Perforated or Screened Casing		Vibrating Wire Piezometer

PERCENTAGES TERMS^{1,2}

Trace	< 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

¹Gravel, sand, and fines estimated by mass. Other constituents, such as organics, cobbles, and boulders, estimated by volume.

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SOIL DESCRIPTION AND LOG KEY

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FIG. A-1
Sheet 1 of 3

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(Modified From USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL	TYPICAL IDENTIFICATIONS
COARSE-GRAINED SOILS (more than 50% retained on No. 200 sieve)	Gravels (more than 50% of coarse fraction retained on No. 4 sieve)	Gravel (less than 5% fines)	GW	Well-Graded Gravel; Well-Graded Gravel with Sand
			GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel (more than 12% fines)	GM	Silty Gravel; Silty Gravel with Sand
			GC	Clayey Gravel; Clayey Gravel with Sand
	Sands (50% or more of coarse fraction passes the No. 4 sieve)	Sand (less than 5% fines)	SW	Well-Graded Sand; Well-Graded Sand with Gravel
			SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand (more than 12% fines)	SM	Silty Sand; Silty Sand with Gravel
			SC	Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS (50% or more passes the No. 200 sieve)	Silts and Clays (liquid limit less than 50)	Inorganic	ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
		Organic	OL	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
	Silts and Clays (liquid limit 50 or more)	Inorganic	MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
		Organic	OH	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat or other highly organic soils (see ASTM D4427)

NOTE: No. 4 size = 4.75 mm = 0.187 in.; No. 200 size = 0.075 mm = 0.003 in.

NOTES

1. Dual symbols (symbols separated by a hyphen, i.e., SP-SM, Sand with Silt) are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart. Graphics shown on the logs for these soil types are a combination of the two graphic symbols (e.g., SP and SM).
2. Borderline symbols (symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand) indicate that the soil properties are close to the defining boundary between two groups.

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FIG. A-1
Sheet 2 of 3

GRADATION TERMS

Poorly Graded	Narrow range of grain sizes present or, within the range of grain sizes present, one or more sizes are missing (Gap Graded). Meets criteria in ASTM D2487, if tested.
Well-Graded	Full range and even distribution of grain sizes present. Meets criteria in ASTM D2487, if tested.

CEMENTATION TERMS¹

Weak	Crumbles or breaks with handling or slight finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

PLASTICITY²

DESCRIPTION	VISUAL-MANUAL CRITERIA	APPROX. PLASTICITY INDEX RANGE
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.	< 4
Low	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.	4 to 10
Medium	A thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.	10 to 20
High	It take considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.	> 20

ADDITIONAL TERMS

Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

PARTICLE ANGULARITY AND SHAPE TERMS¹

Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width/thickness ratio > 3.
Elongated	Length/width ratio > 3.

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ACRONYMS AND ABBREVIATIONS

ATD	At Time of Drilling
Diam.	Diameter
Elev.	Elevation
ft.	Feet
FeO	Iron Oxide
gal.	Gallons
Horiz.	Horizontal
HSA	Hollow Stem Auger
I.D.	Inside Diameter
in.	Inches
lbs.	Pounds
MgO	Magnesium Oxide
mm	Millimeter
MnO	Manganese Oxide
NA	Not Applicable or Not Available
NP	Nonplastic
O.D.	Outside Diameter
OW	Observation Well
pcf	Pounds per Cubic Foot
PID	Photo-Ionization Detector
PMT	Pressuremeter Test
ppm	Parts per Million
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
rpm	Rotations per Minute
SPT	Standard Penetration Test
USCS	Unified Soil Classification System
q _u	Unconfined Compressive Strength
VWP	Vibrating Wire Piezometer
Vert.	Vertical
WOH	Weight of Hammer
WOR	Weight of Rods
Wt.	Weight

STRUCTURE TERMS¹

Interbedded	Alternating layers of varying material or color with layers at least 1/4-inch thick; singular: bed.
Laminated	Alternating layers of varying material or color with layers less than 1/4-inch thick; singular: lamination.
Fissured	Breaks along definite planes or fractures with little resistance.
Slickensided	Fracture planes appear polished or glossy; sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

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FIG. A-1
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FROST CLASSIFICATION
(after Municipality of Anchorage, 2007)

GROUP		0.02 Mil.	P-200*	USC SYSTEM (based on P-200 results)
NFS	Sandy Soils	0 to 3	0 to 6	SW, SP, SW-SM, SP-SM
	Gravelly Soils	0 to 3	0 to 6	GW, GP, GW-GM, GP-GM
F1	Gravelly Soils	3 to 10	6 to 13	GM, GW-GM, GP-GM
F2	Sandy Soils	3 to 15	6 to 19	SP-SM, SW-SM, SM
	Gravelly Soils	10 to 20	13 to 25	GM
F3	Sands, except very fine silty sands**	Over 15	Over 19	SM, SC
	Gravelly Soils	Over 20	Over 25	GM, GC
	Clays, PI>12			CL, CH
F4	All Silts			ML, MH
	Very fine silty sands**	Over 15	Over 19	SM, SC
	Clays, PI<12			CL, CL-ML
	Varved clays and other finned grained, banded sediments			CL and ML CL, ML, and SM; SL, SH, and ML; CL, CH, ML, and SM

PI = Plasticity Index

P-200 = Percent passing the number 200 sieve

0.02 Mil. = Percent material below 0.02 millimeter grain size

*Approximate P-200 value equivalent for frost classification.
Value range based on typical, well-graded soil curves.

** Very fine sand : greater than 50% of sand
fraction passing the number 100 sieve

Yakutat Airport Water Line Extension
Yakutat, Alaska

FROST CLASSIFICATION LEGEND

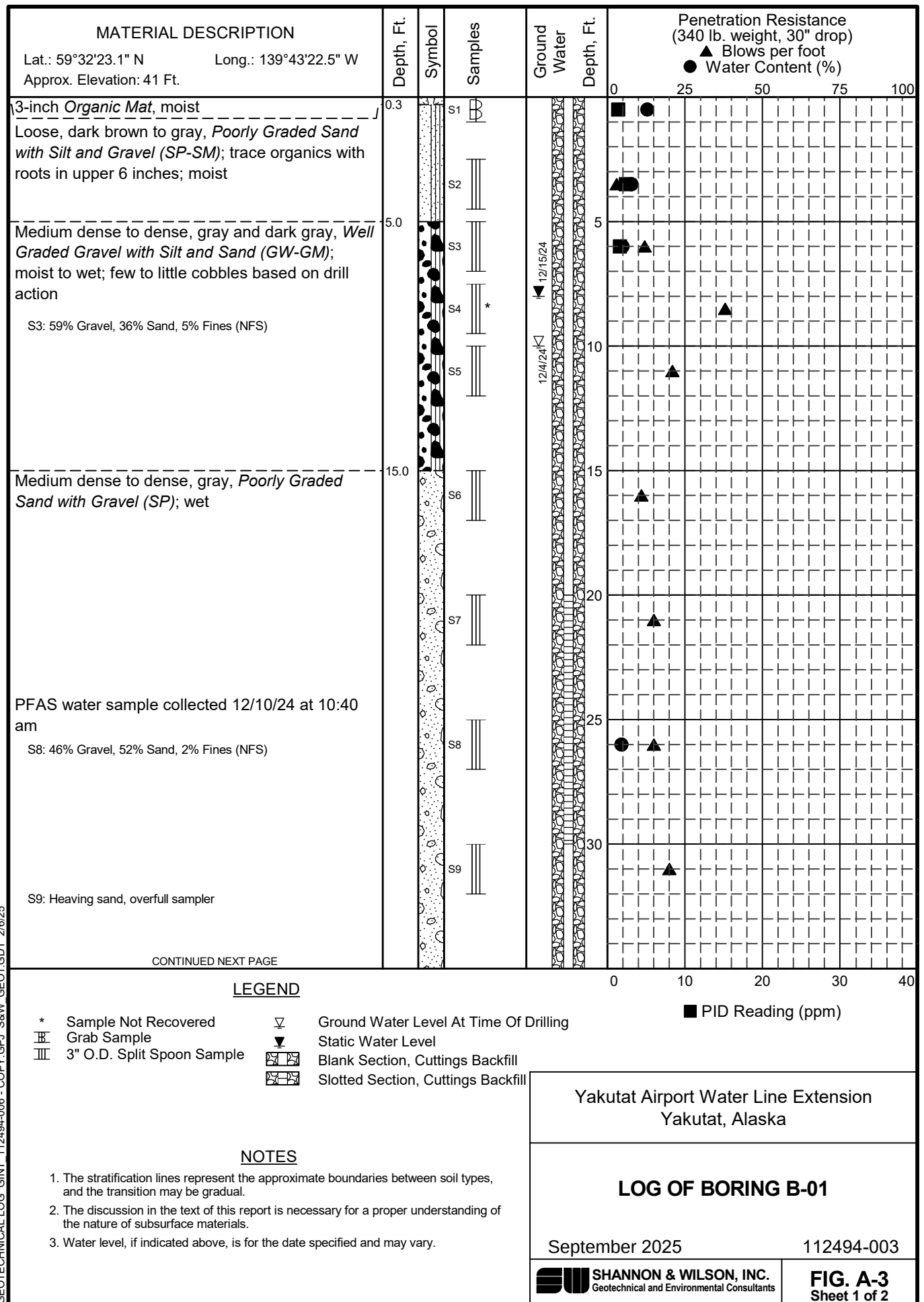
September 2025

112494-003



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

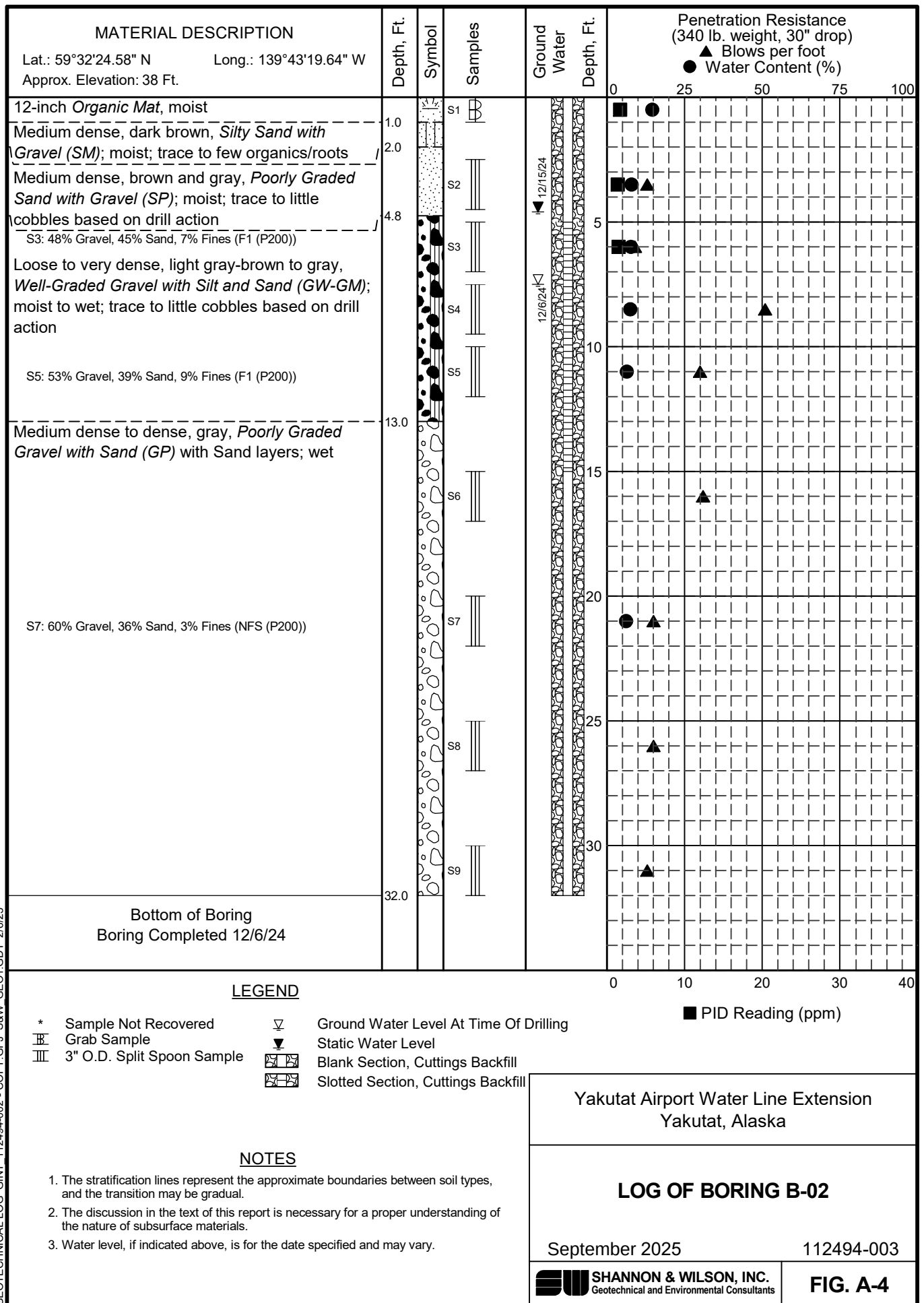
FIG. A-2

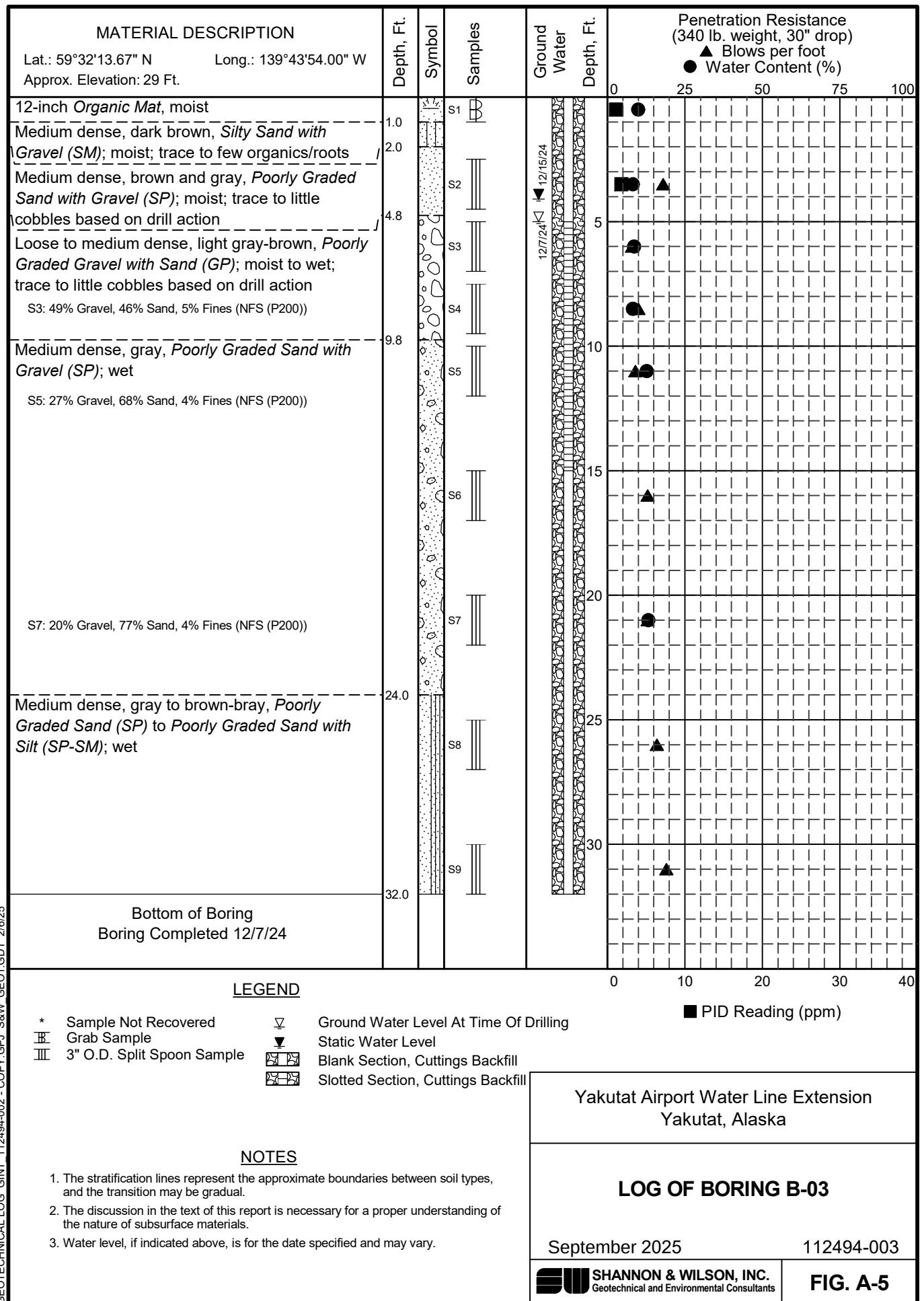


GEOTECHNICAL LOG GINT 112494-006 - COPY.GPJ S&W GEO1.GDT 2/6/25

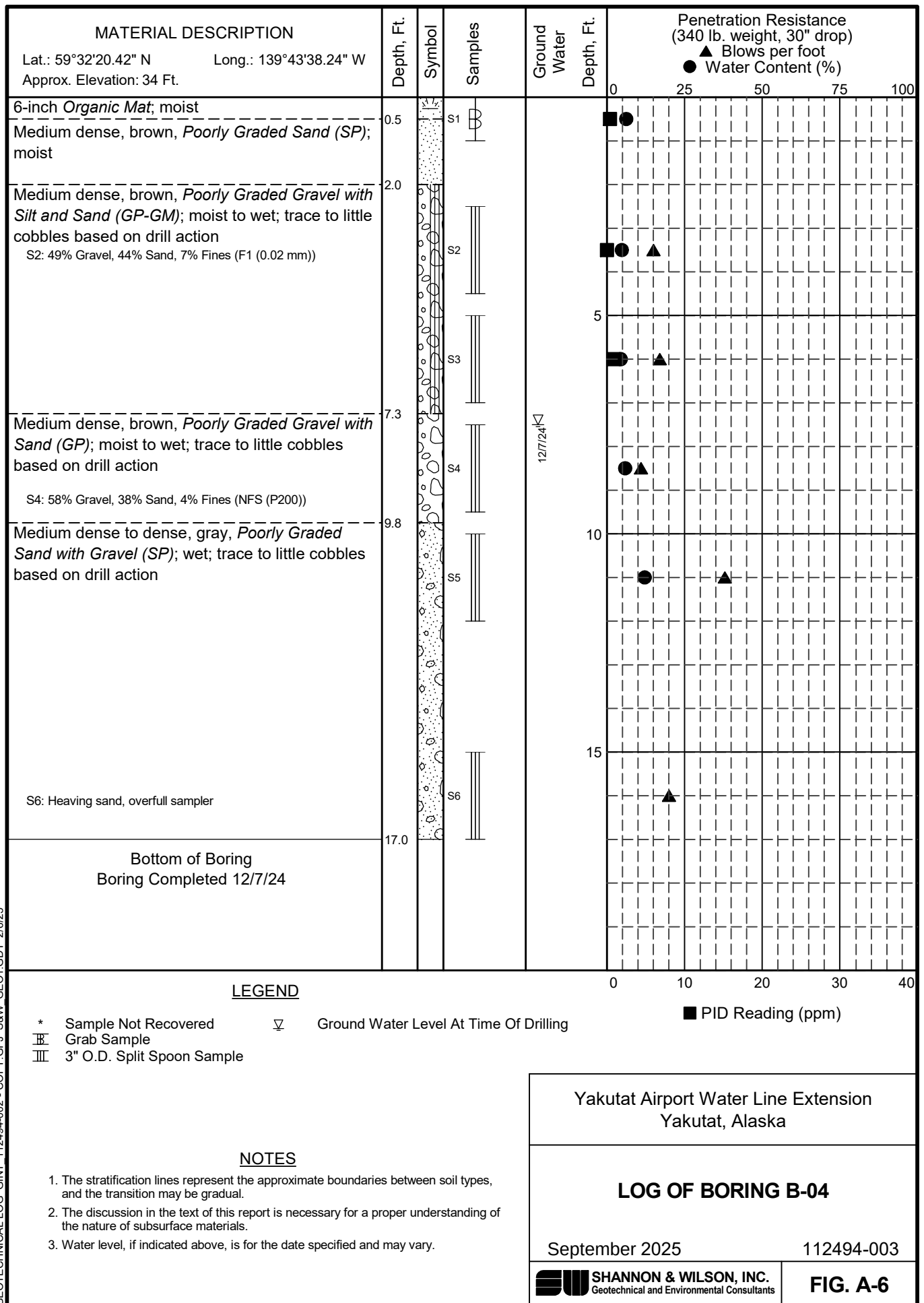
MATERIAL DESCRIPTION		Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.	Penetration Resistance (340 lb. weight, 30" drop) ▲ Blows per foot ● Water Content (%)				
Lat.: 59°32'23.1" N Long.: 139°43'22.5" W Approx. Elevation: 41 Ft.							0	25	50	75	100
Medium dense to dense, gray, <i>Poorly Graded Sand with Gravel (SP)</i> ; wet S10: 35% Gravel, 61% Sand, 4% Fines (NFS)				S10							
				S11			40				
				S12			45				
Dense, gray, <i>Poorly Graded Sand with Silt and Gravel (SP-SM)</i> ; wet S13: Heaving sand, overfull sampler S: 29% Gravel, 61% Sand, 10% Fines (F2)		49.0		S13			50				
							55				
Bottom of Boring Boring Completed 12/4/24		60.0					60				
Boring backfilled with bentonite from approx. 10 feet bgs to ground surface							65				
LEGEND											
* Sample Not Recovered		▽ Ground Water Level At Time Of Drilling				■ PID Reading (ppm)					
▬ Grab Sample		▼ Static Water Level									
▮ 3" O.D. Split Spoon Sample		Blank Section, Cuttings Backfill									
		Slotted Section, Cuttings Backfill									
NOTES											
1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.											
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.											
3. Water level, if indicated above, is for the date specified and may vary.											
Yakutat Airport Water Line Extension Yakutat, Alaska											
LOG OF BORING B-01											
September 2025112494-003											
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants											
FIG. A-3 Sheet 2 of 2											

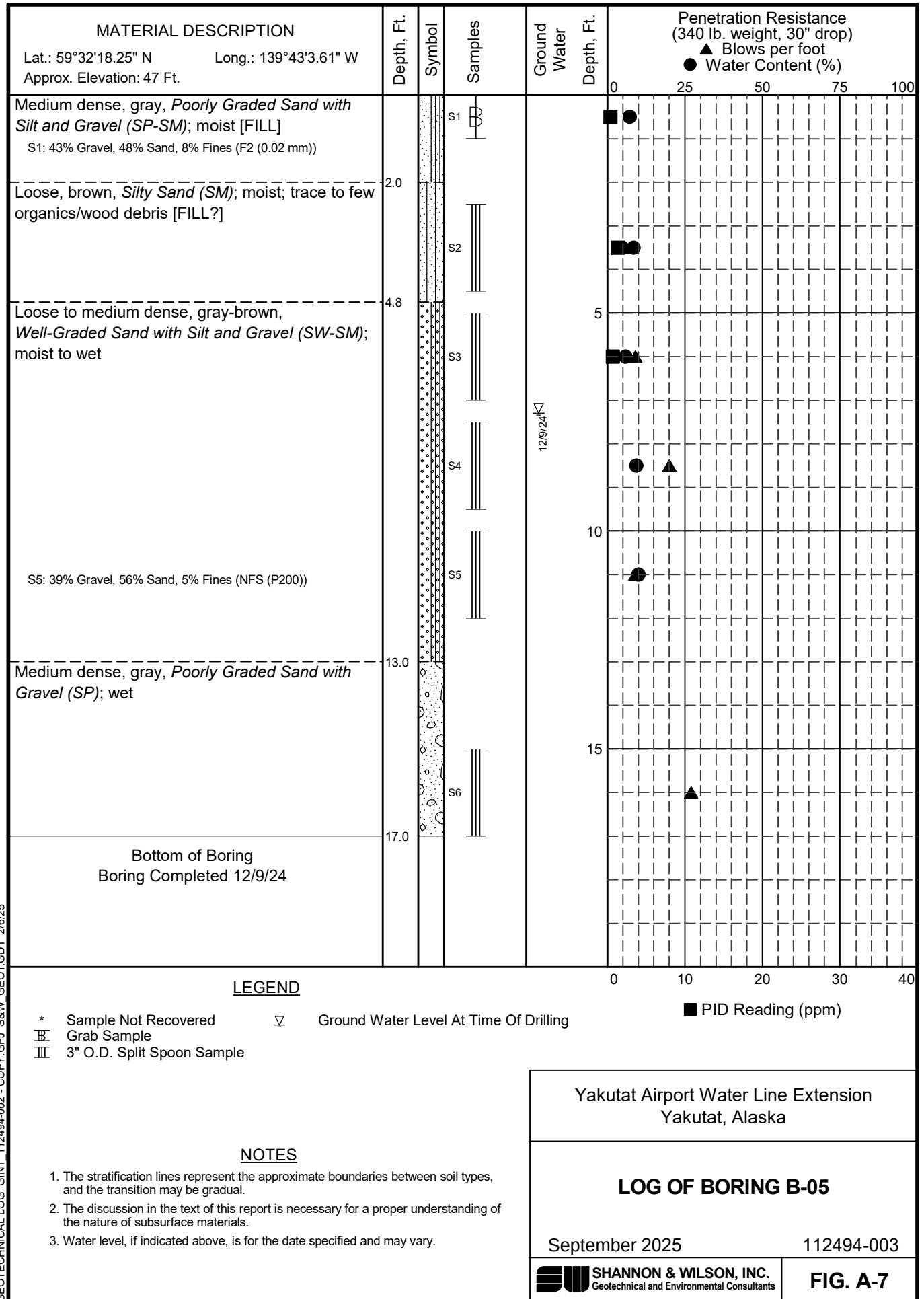
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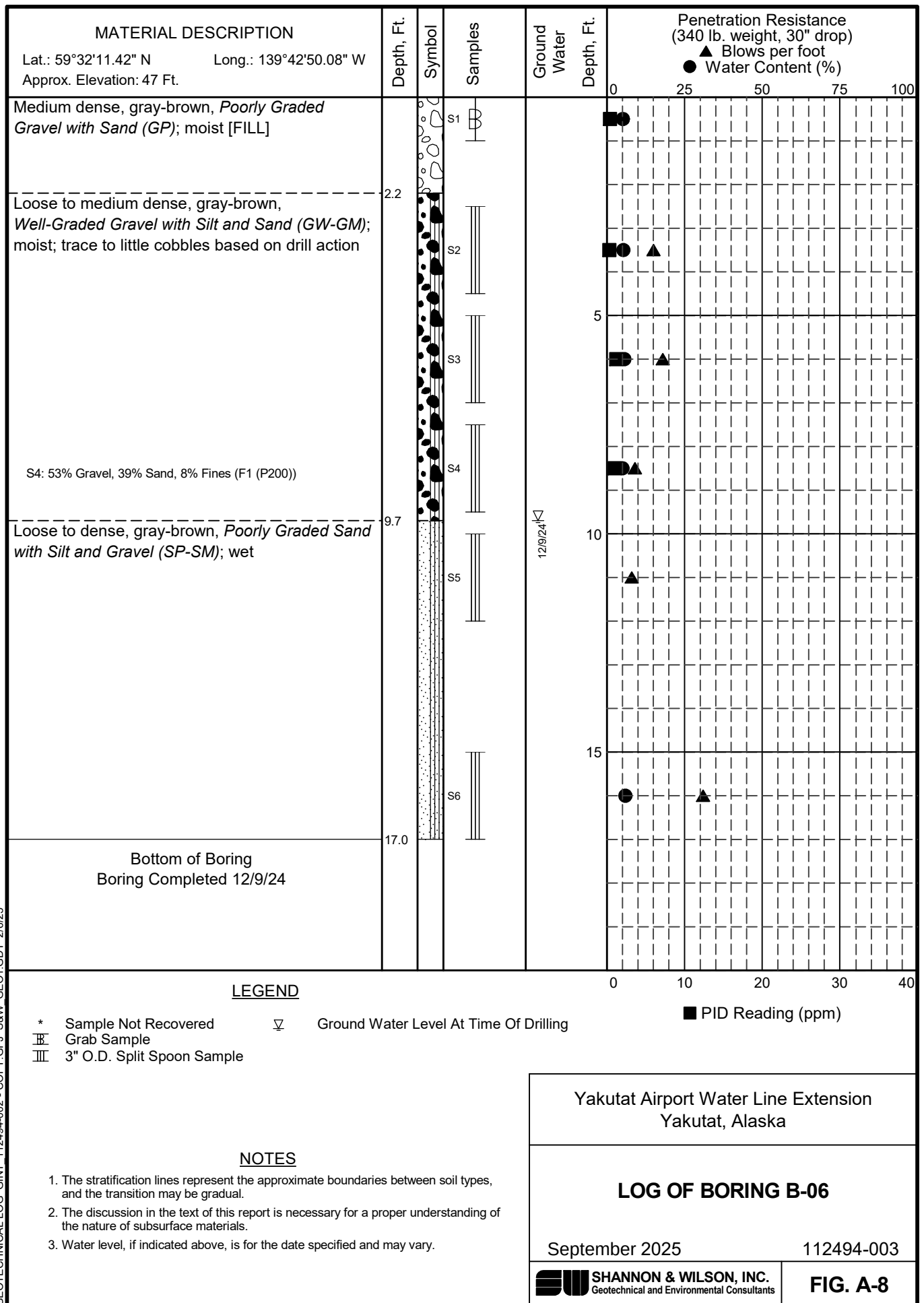
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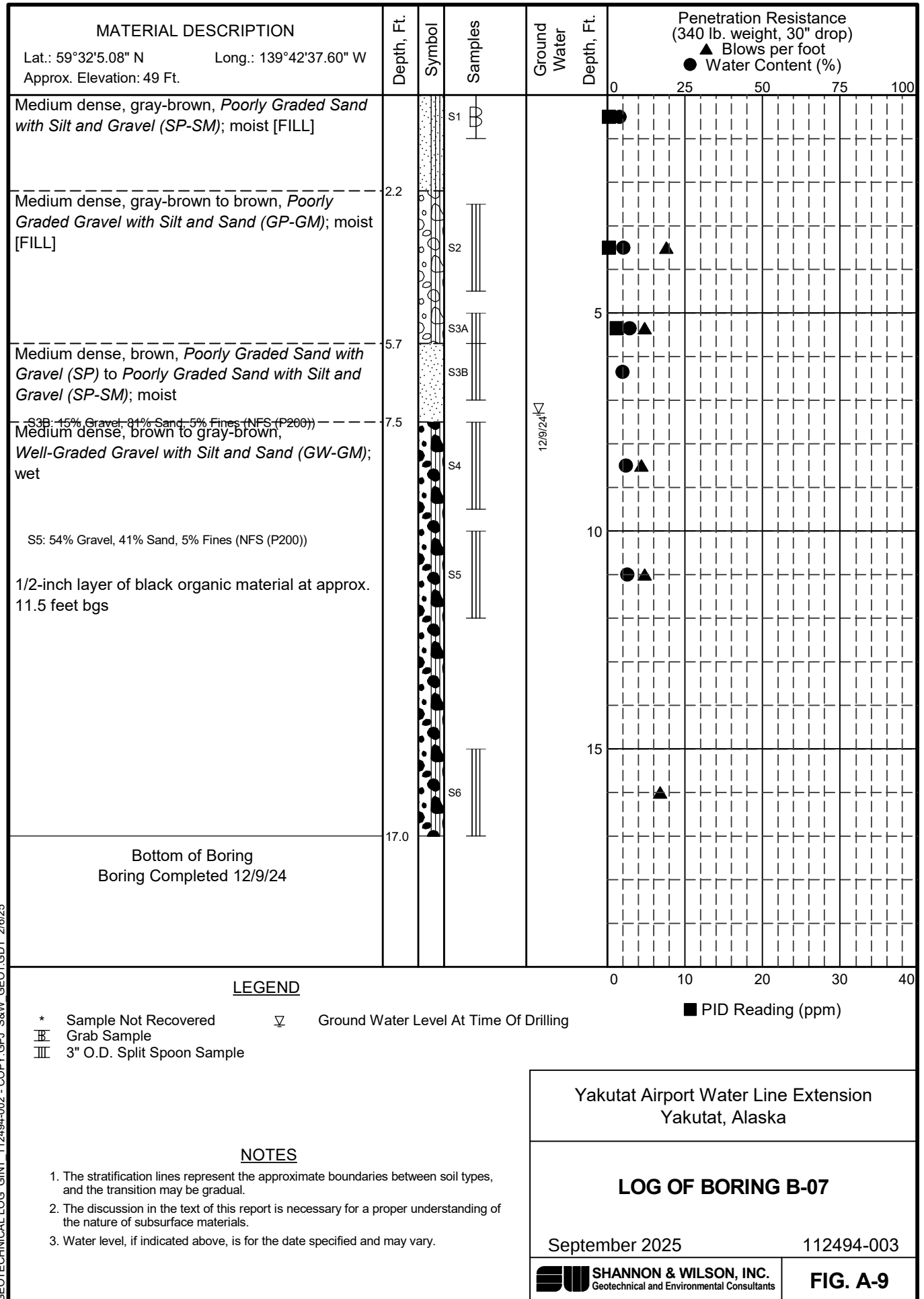




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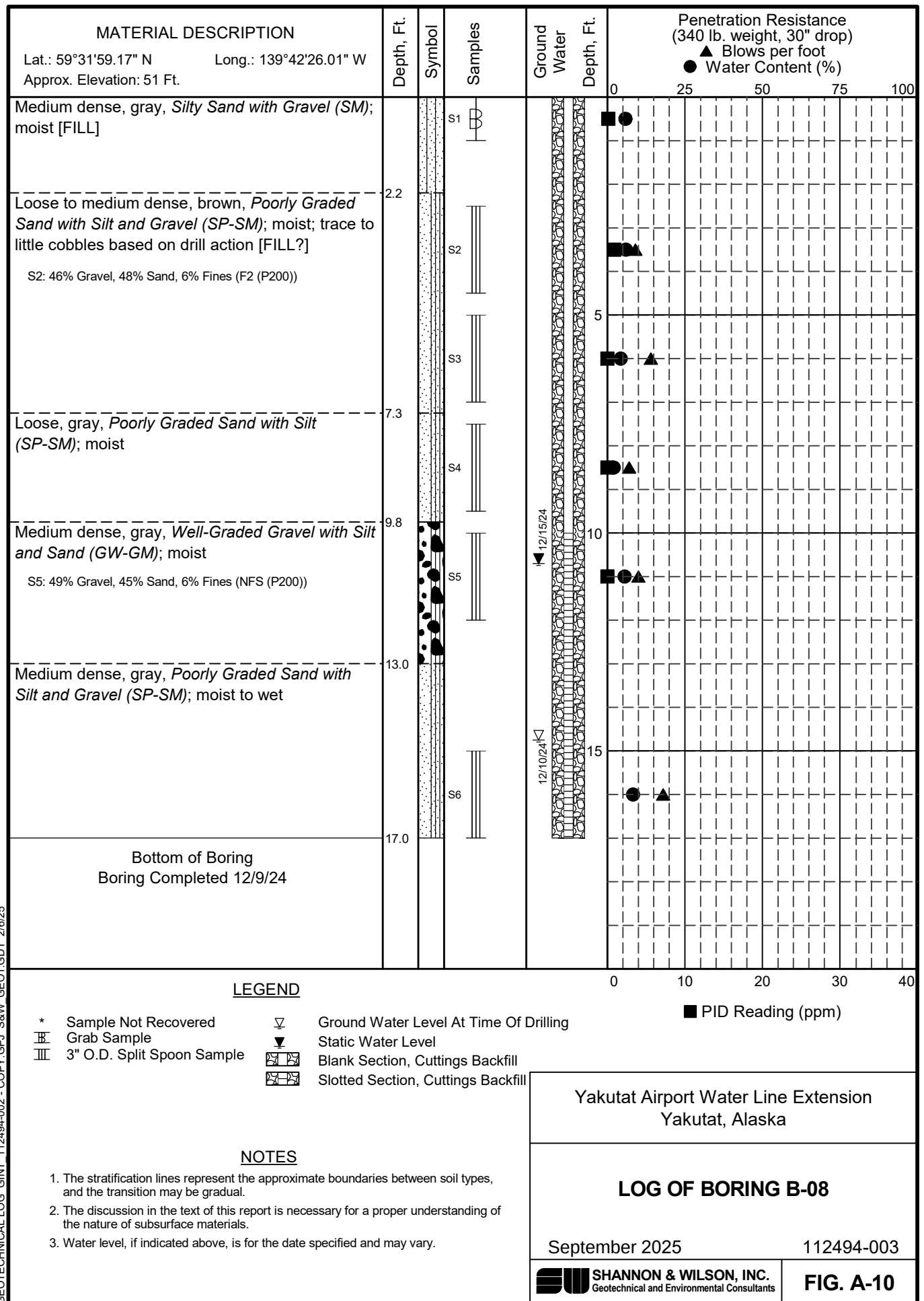
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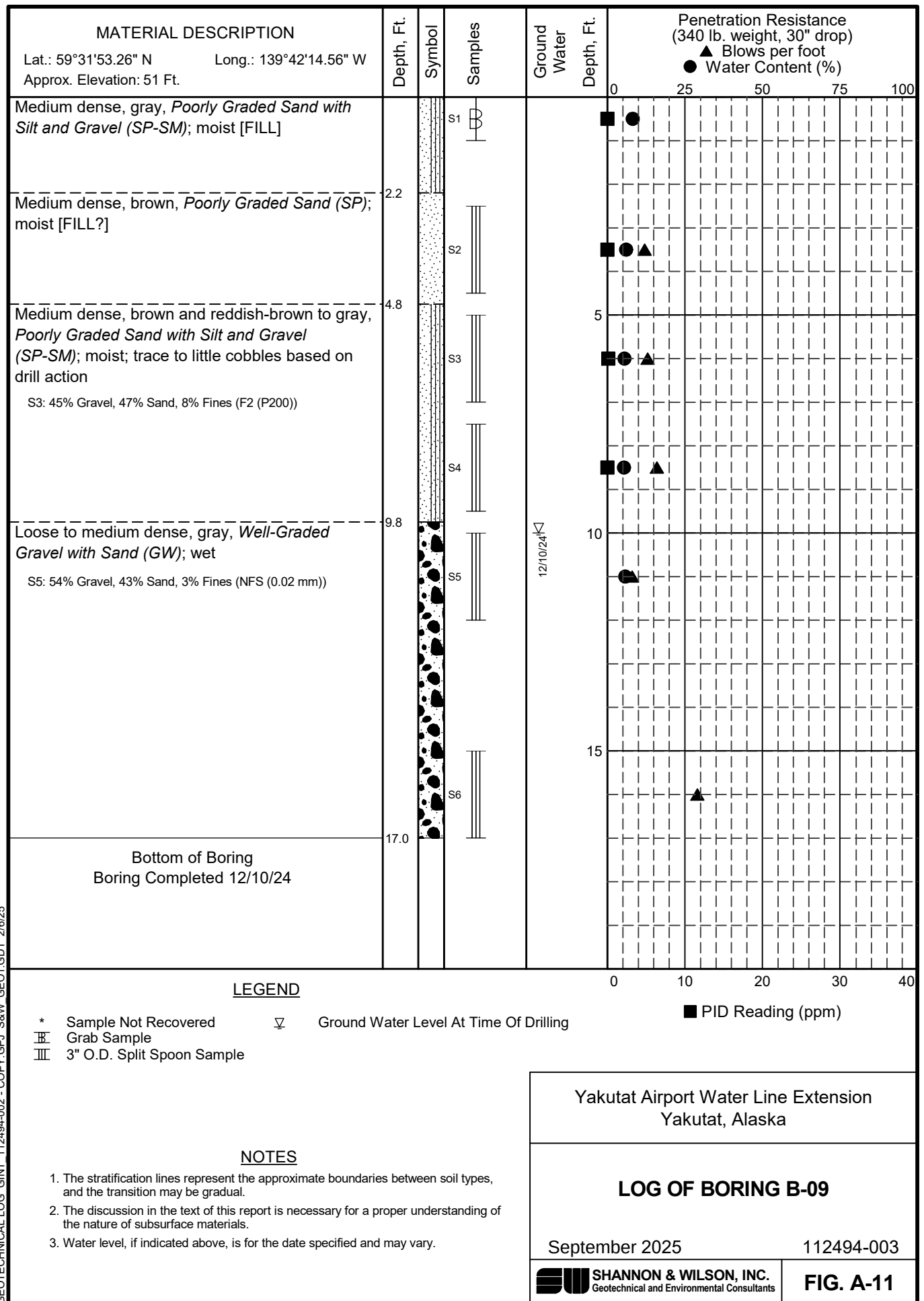


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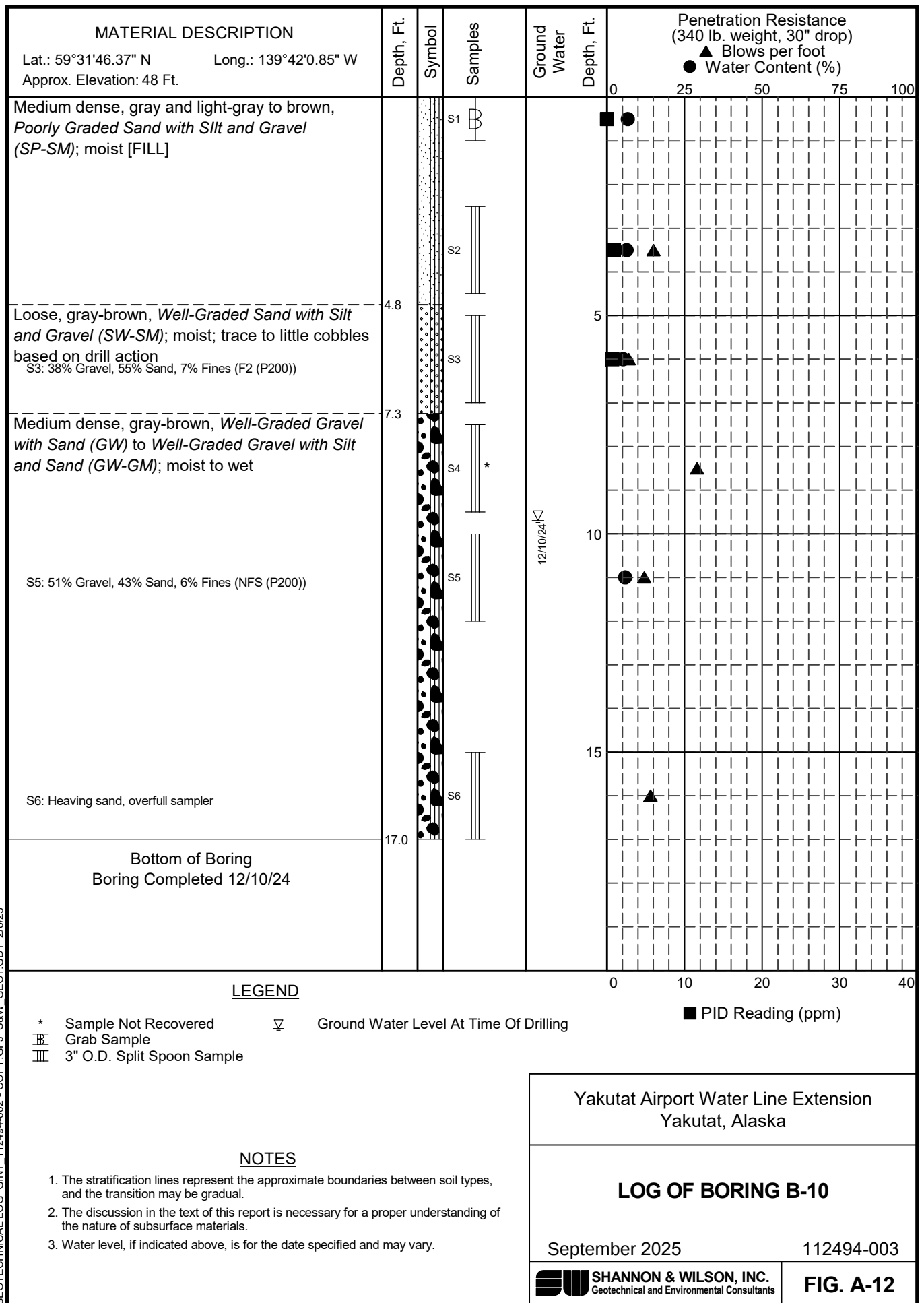
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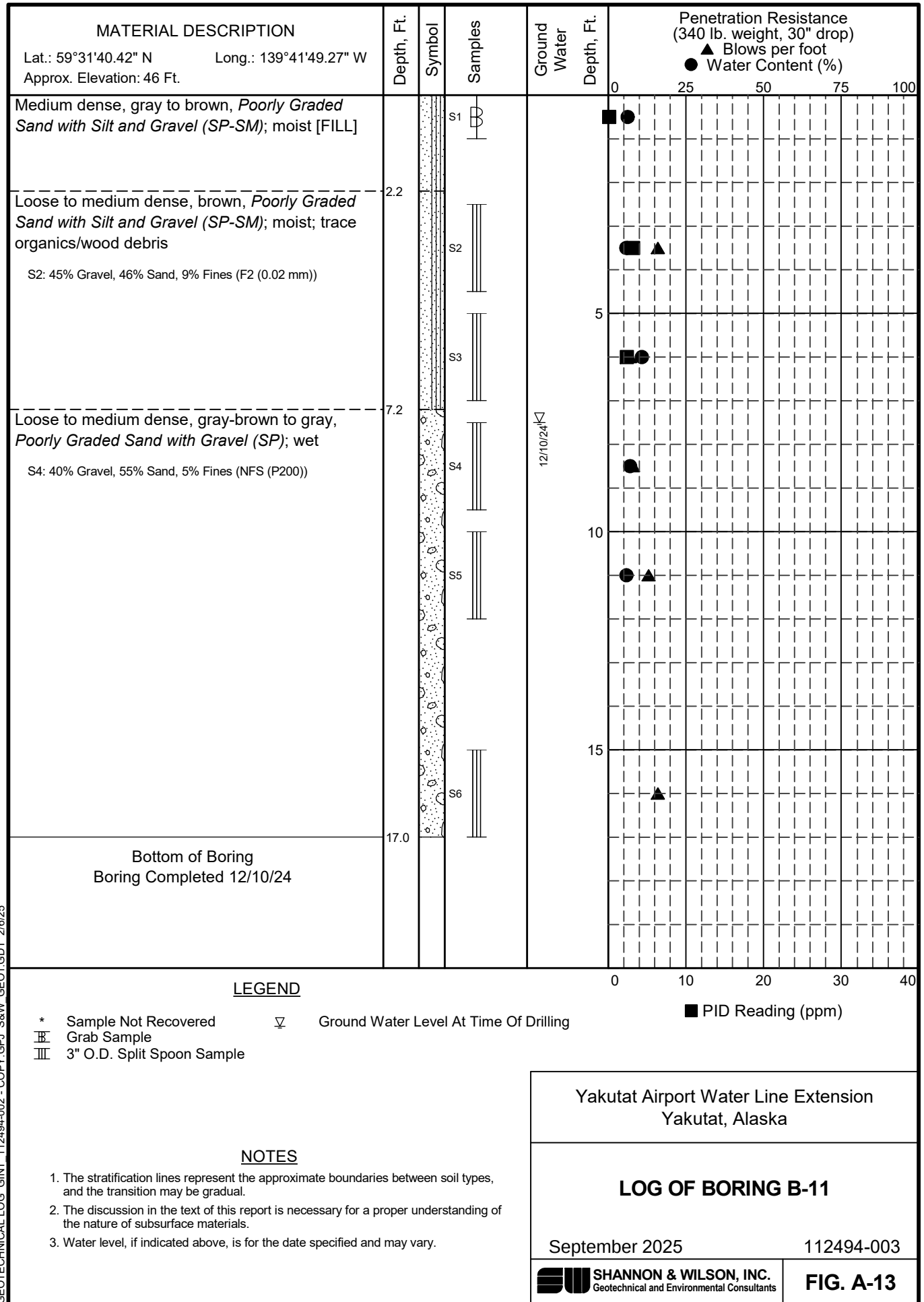


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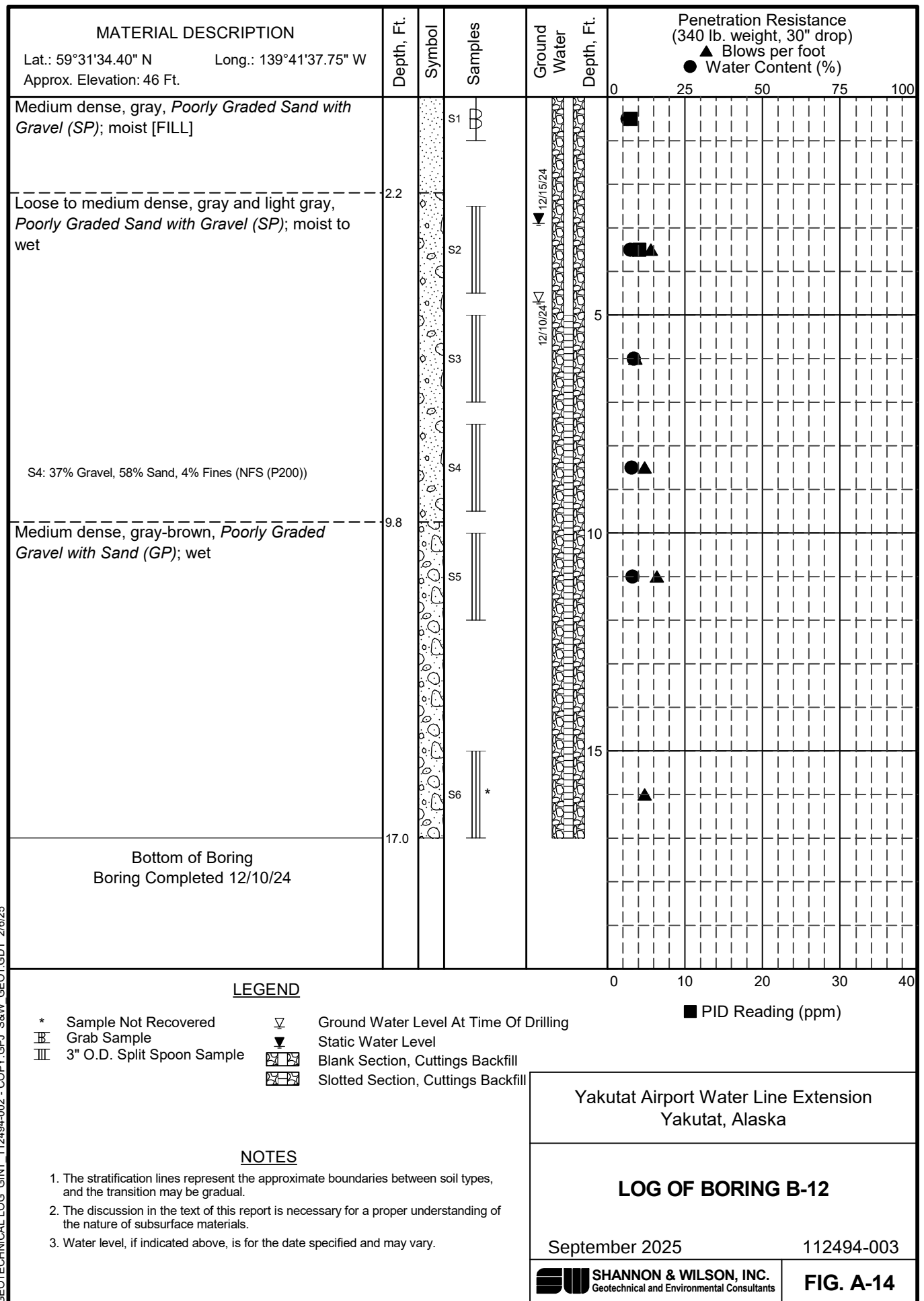
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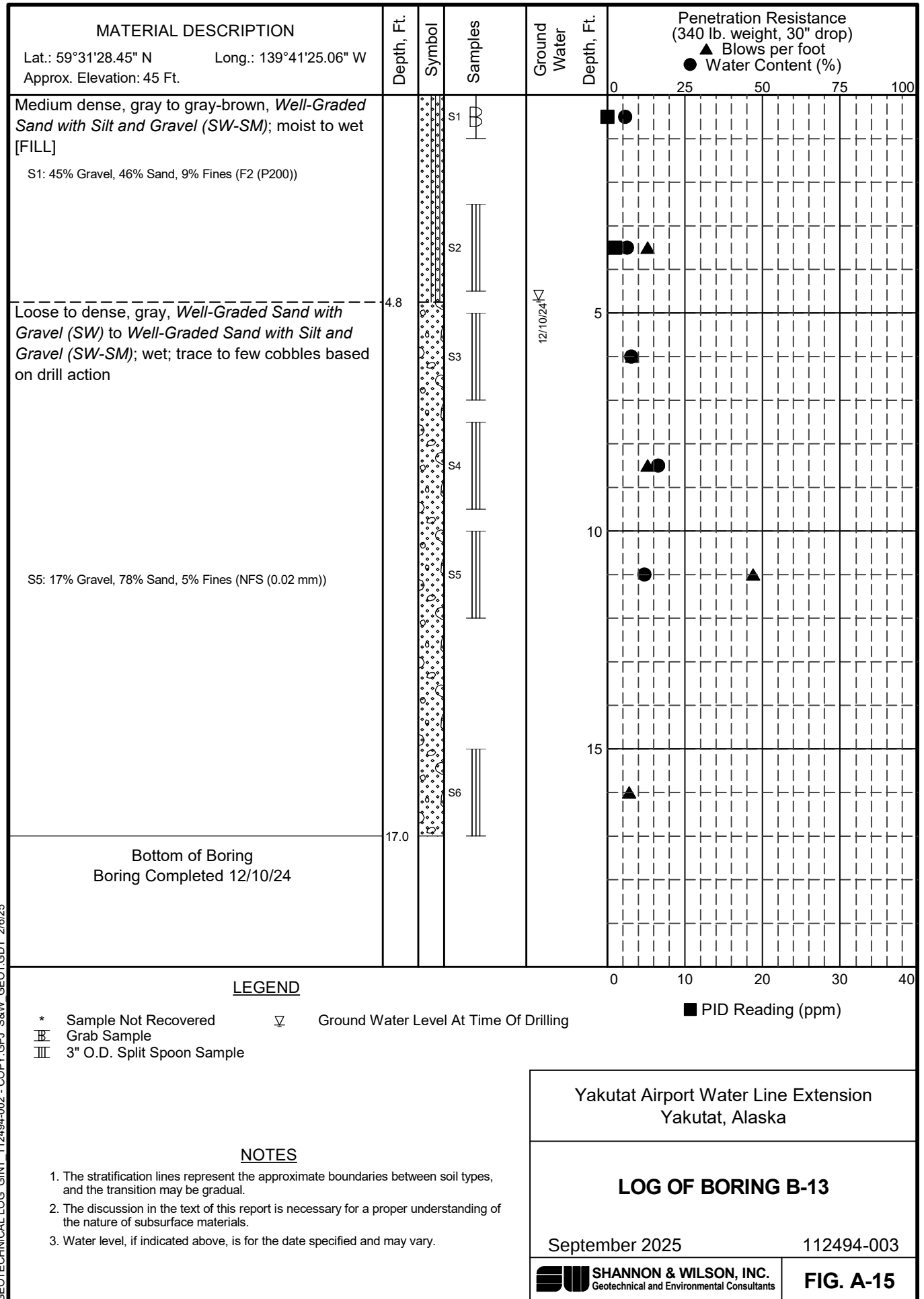




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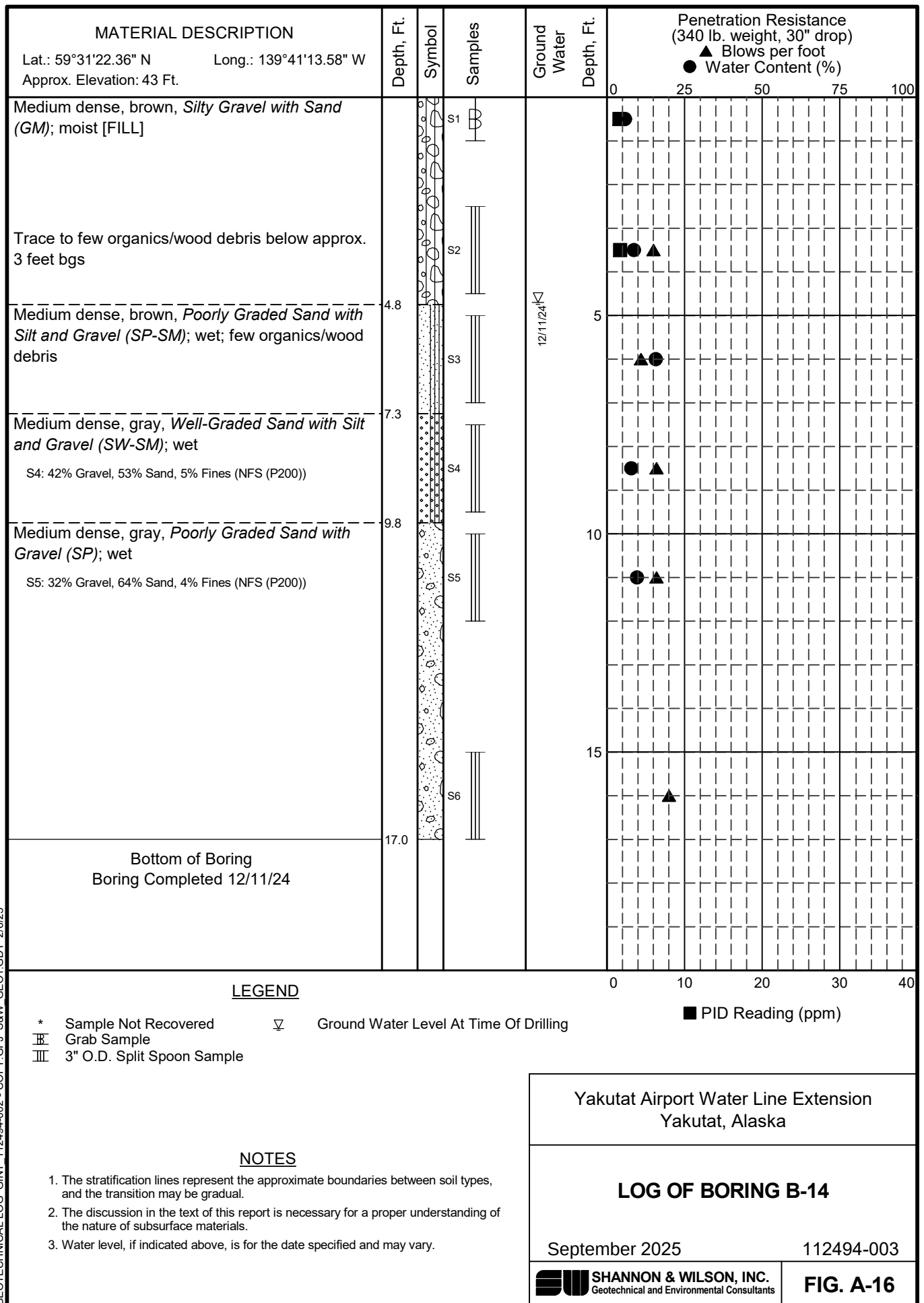
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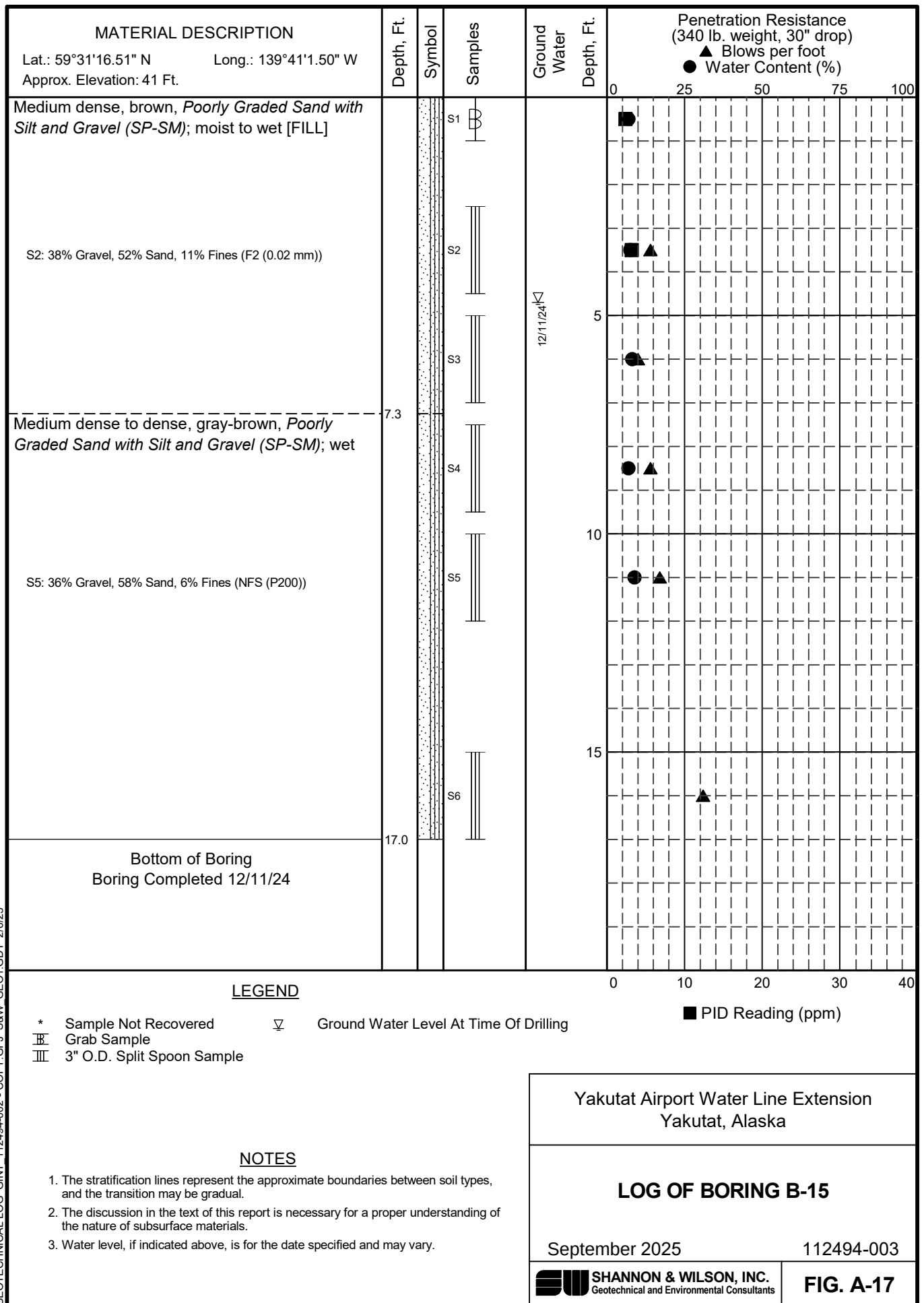


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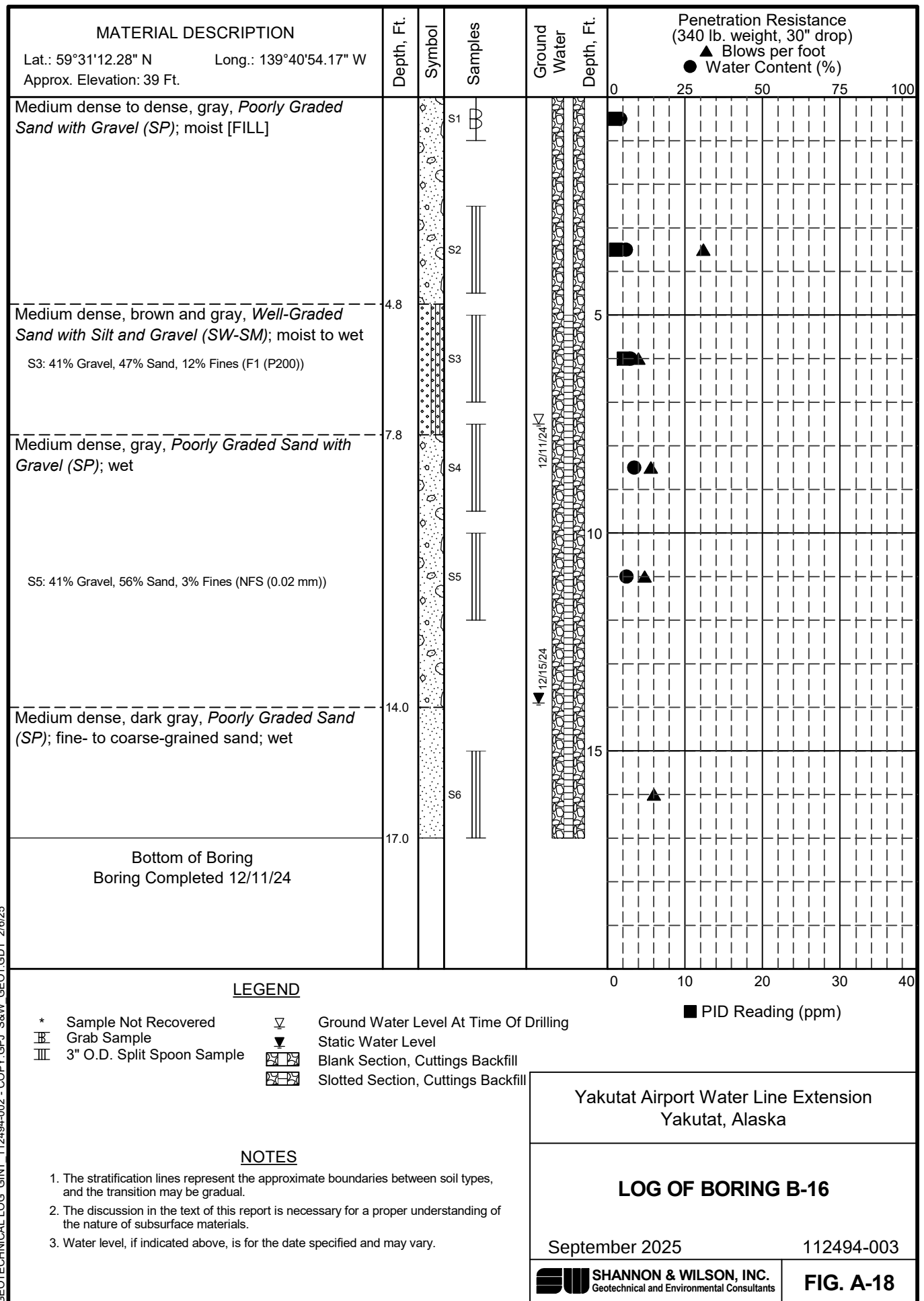
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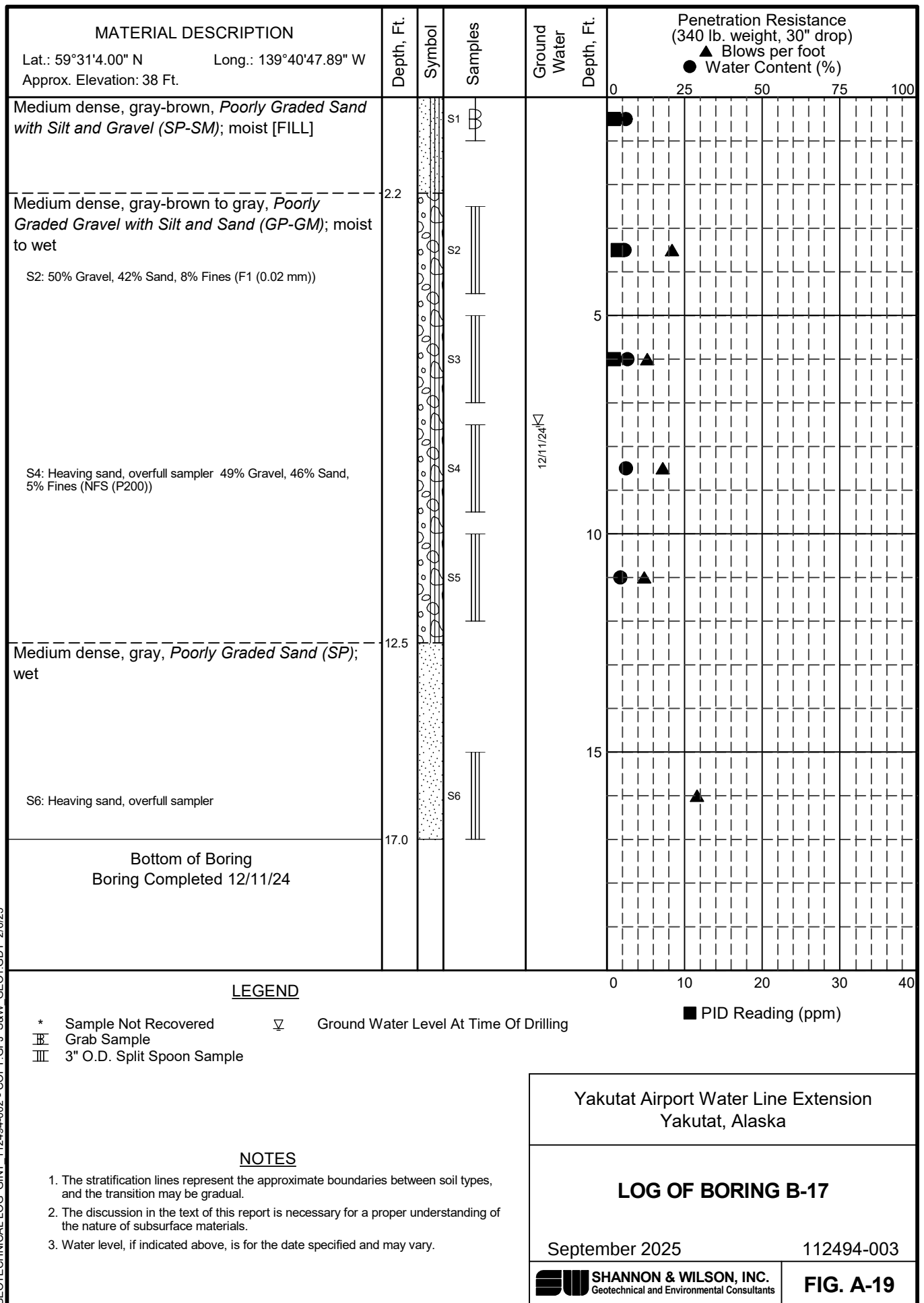
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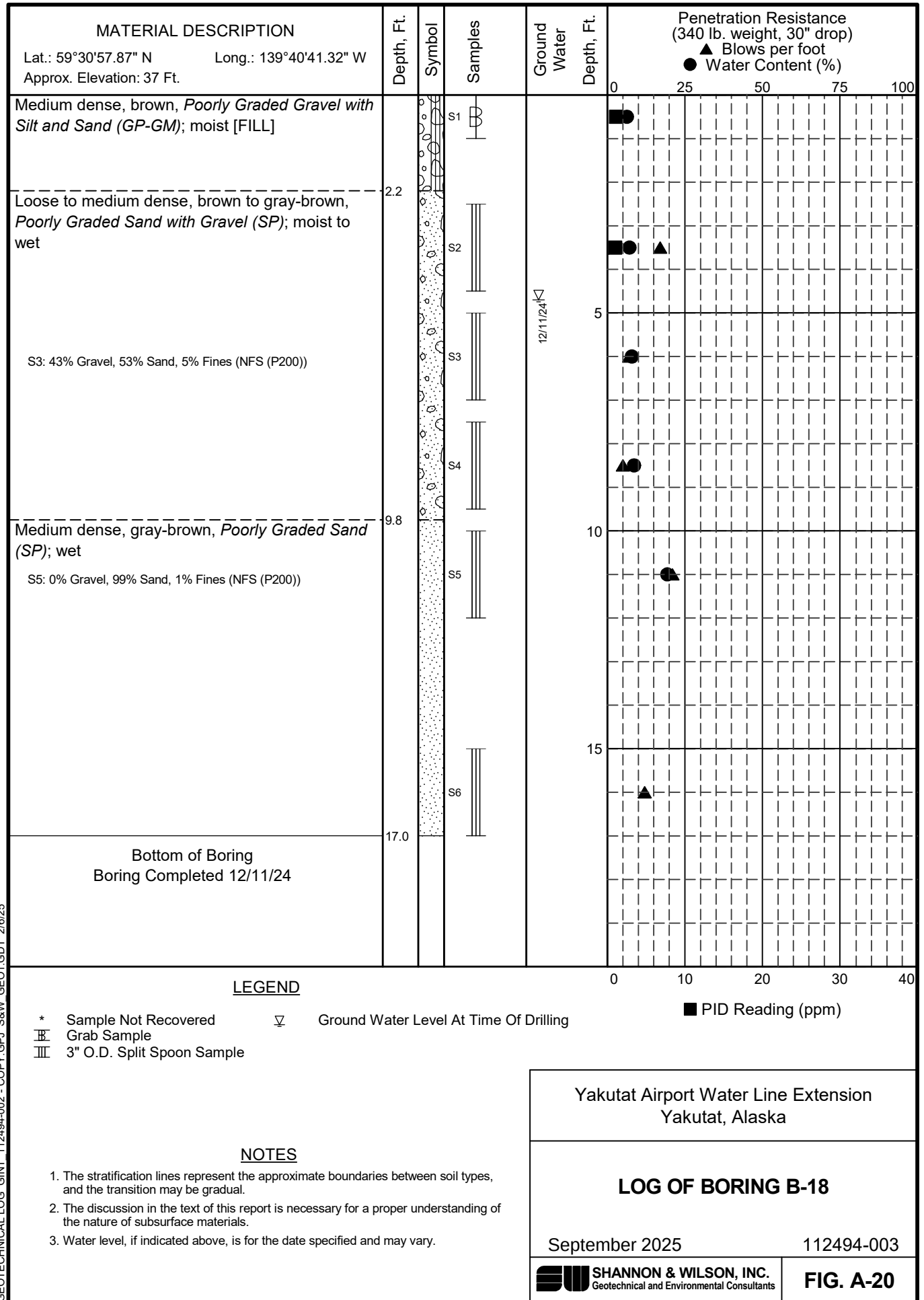


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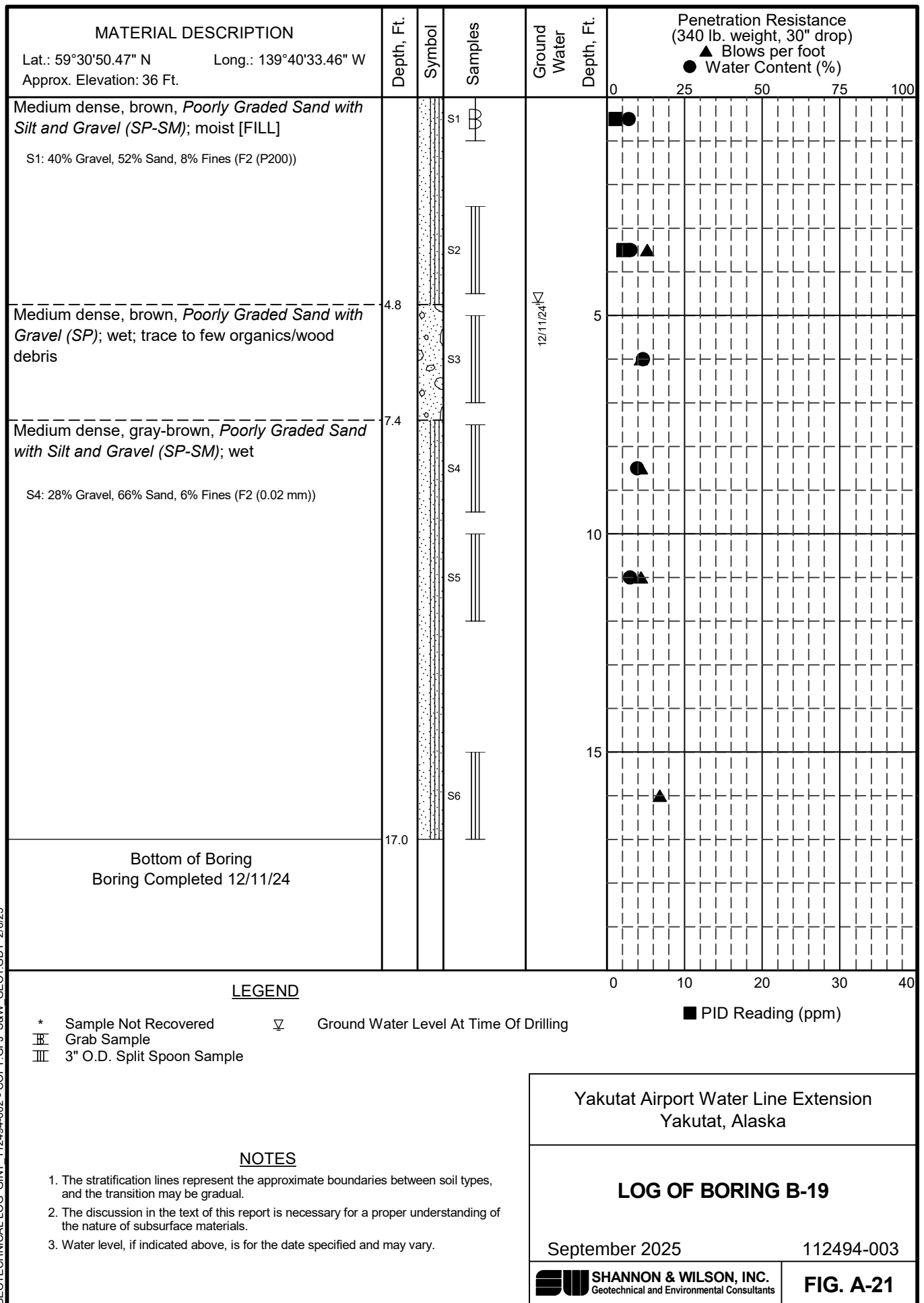
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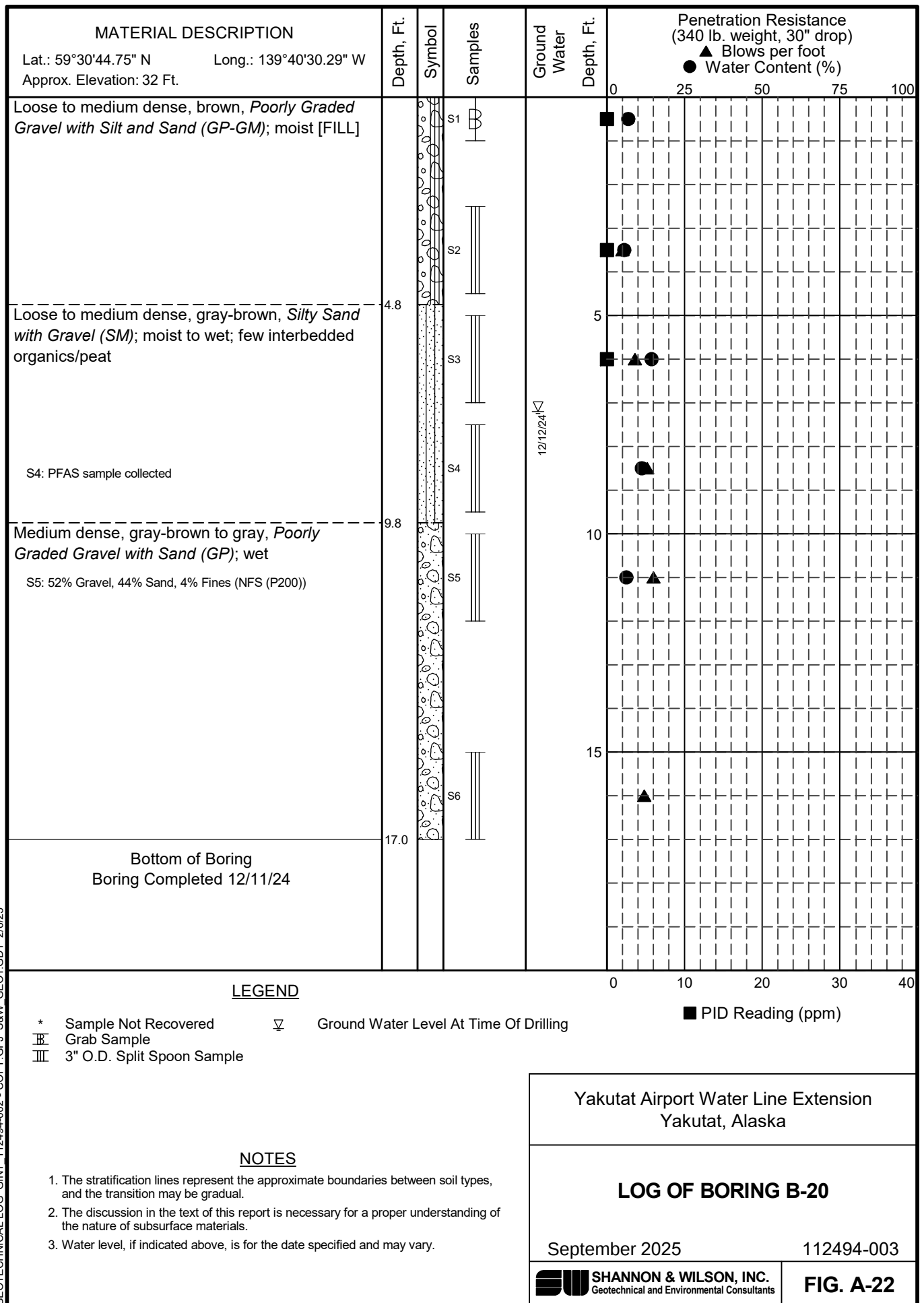


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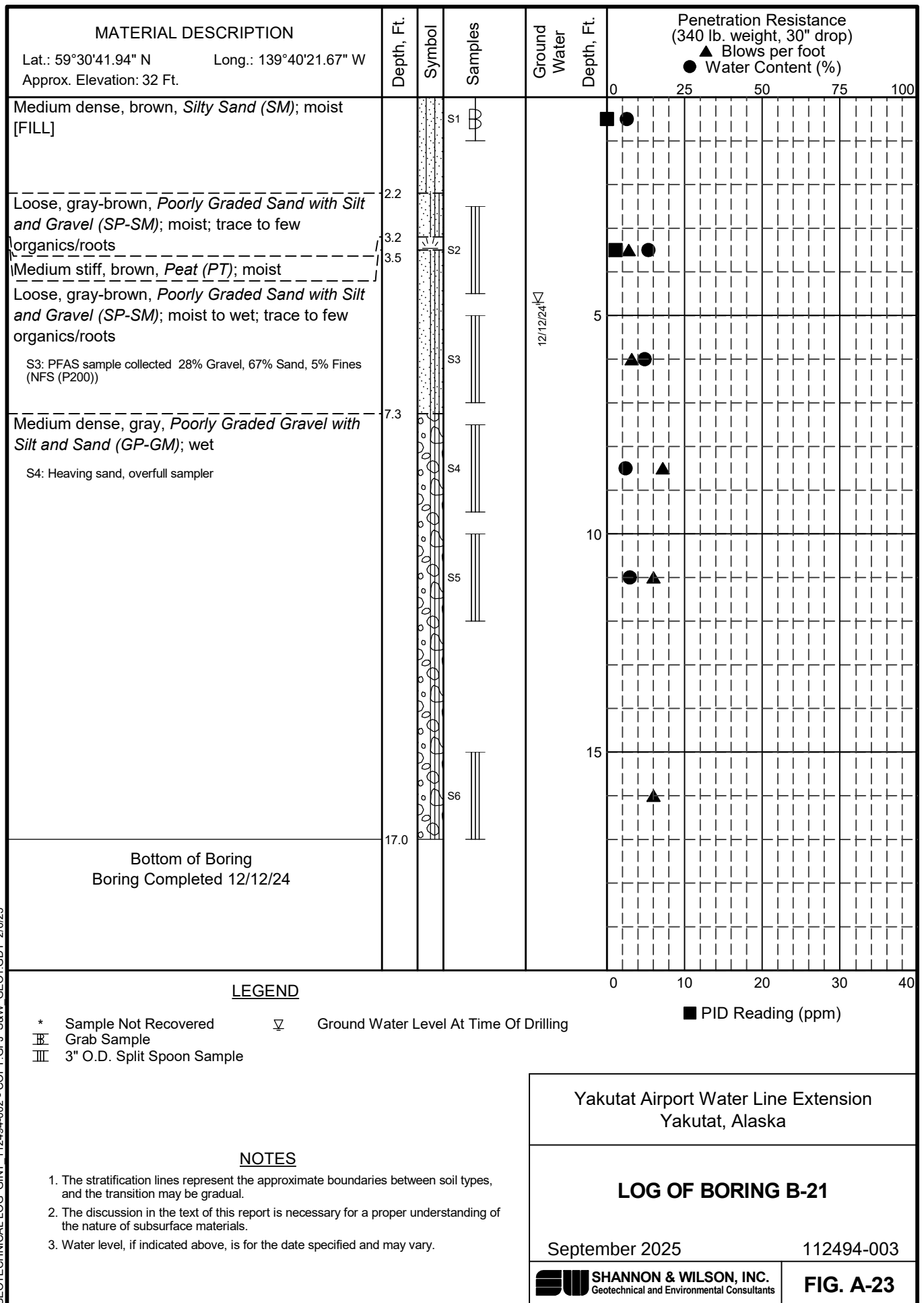
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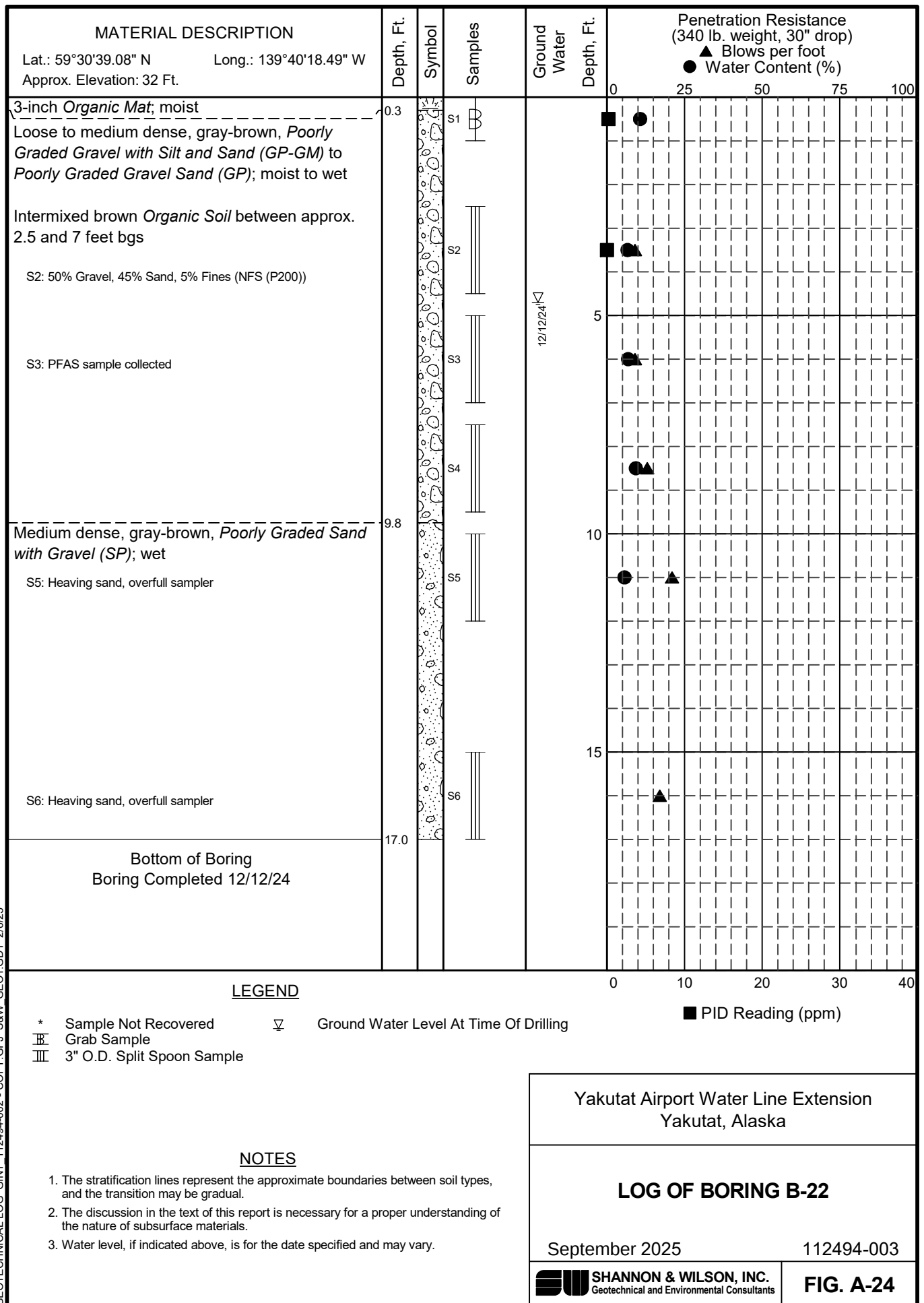
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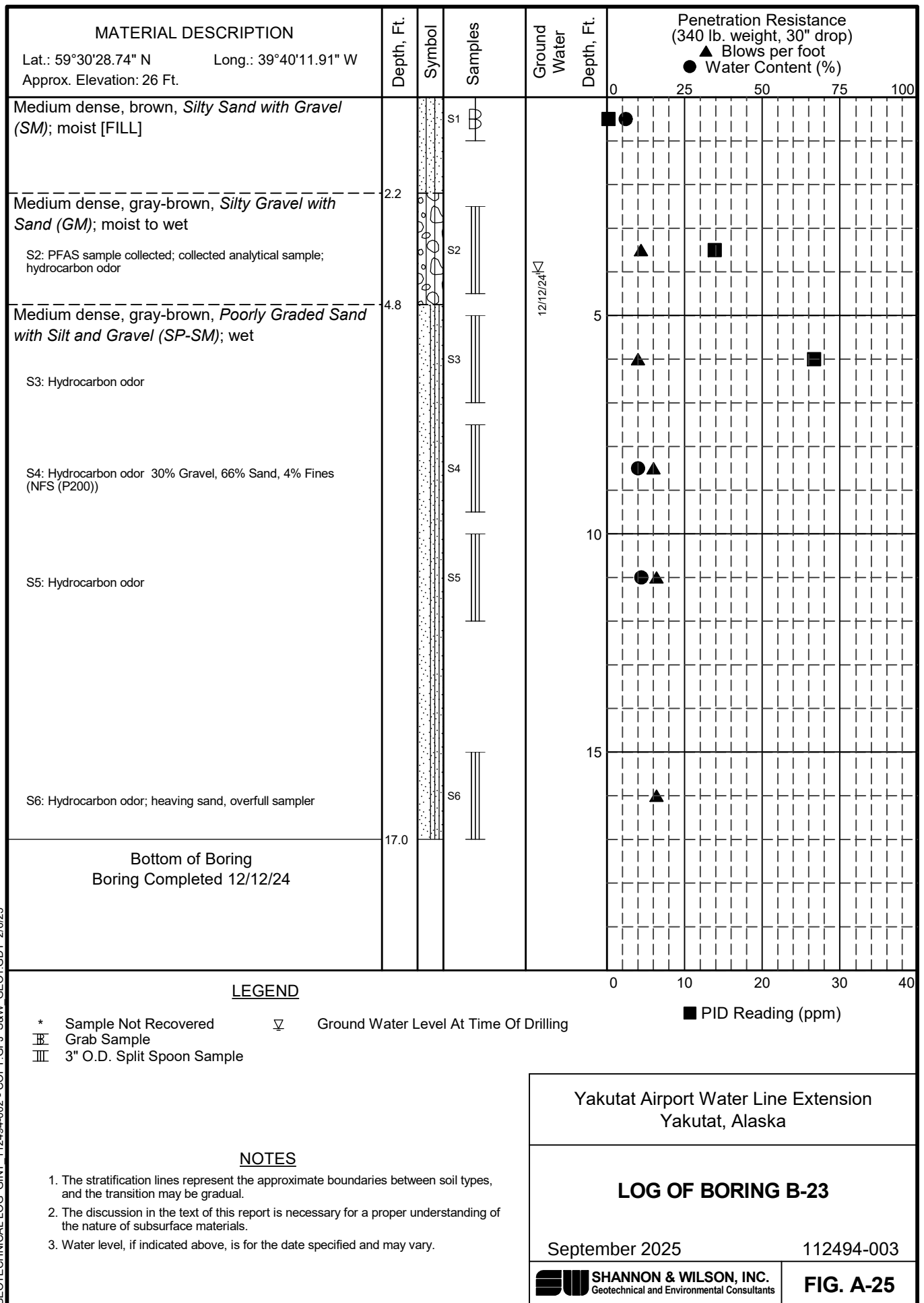
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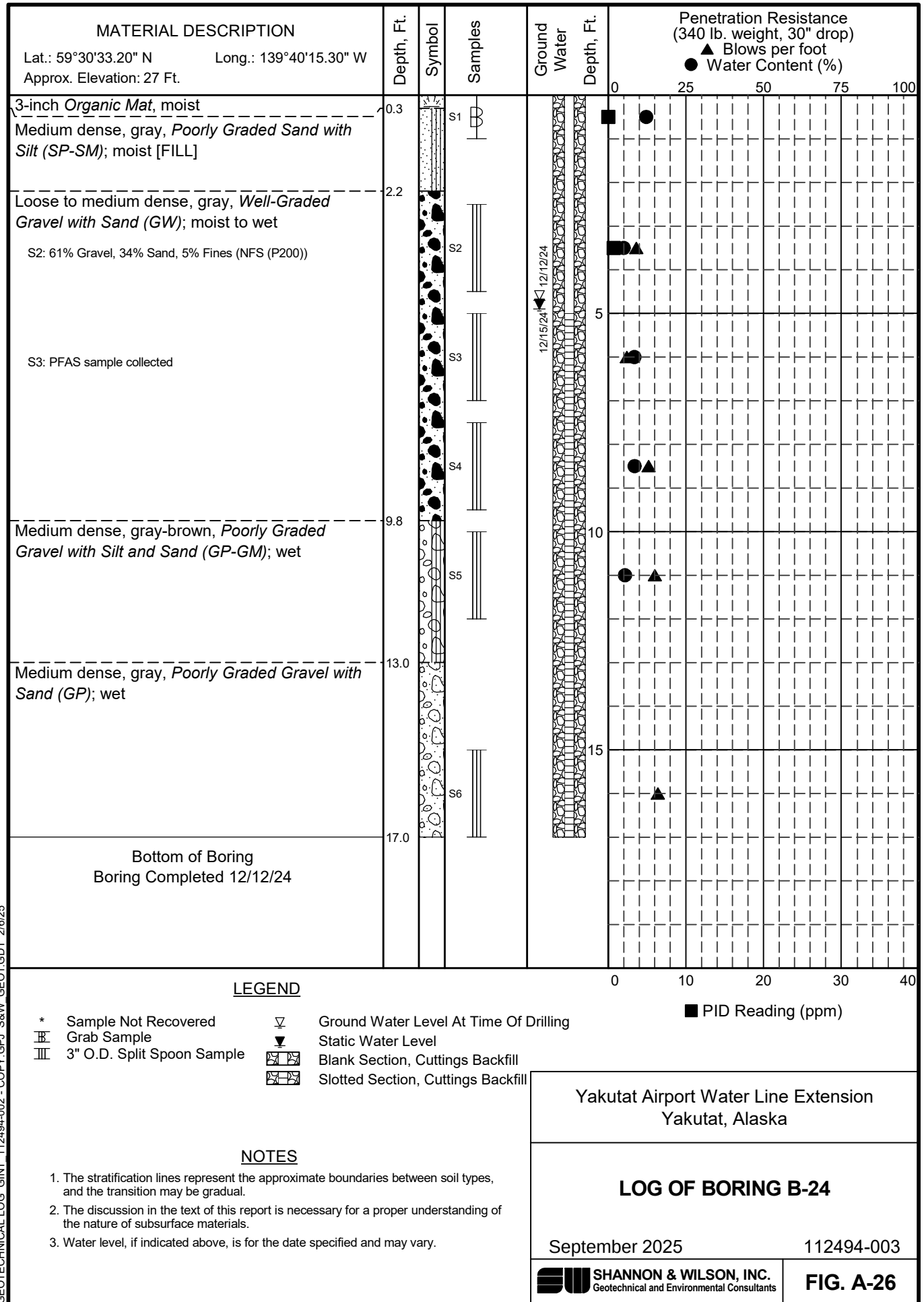


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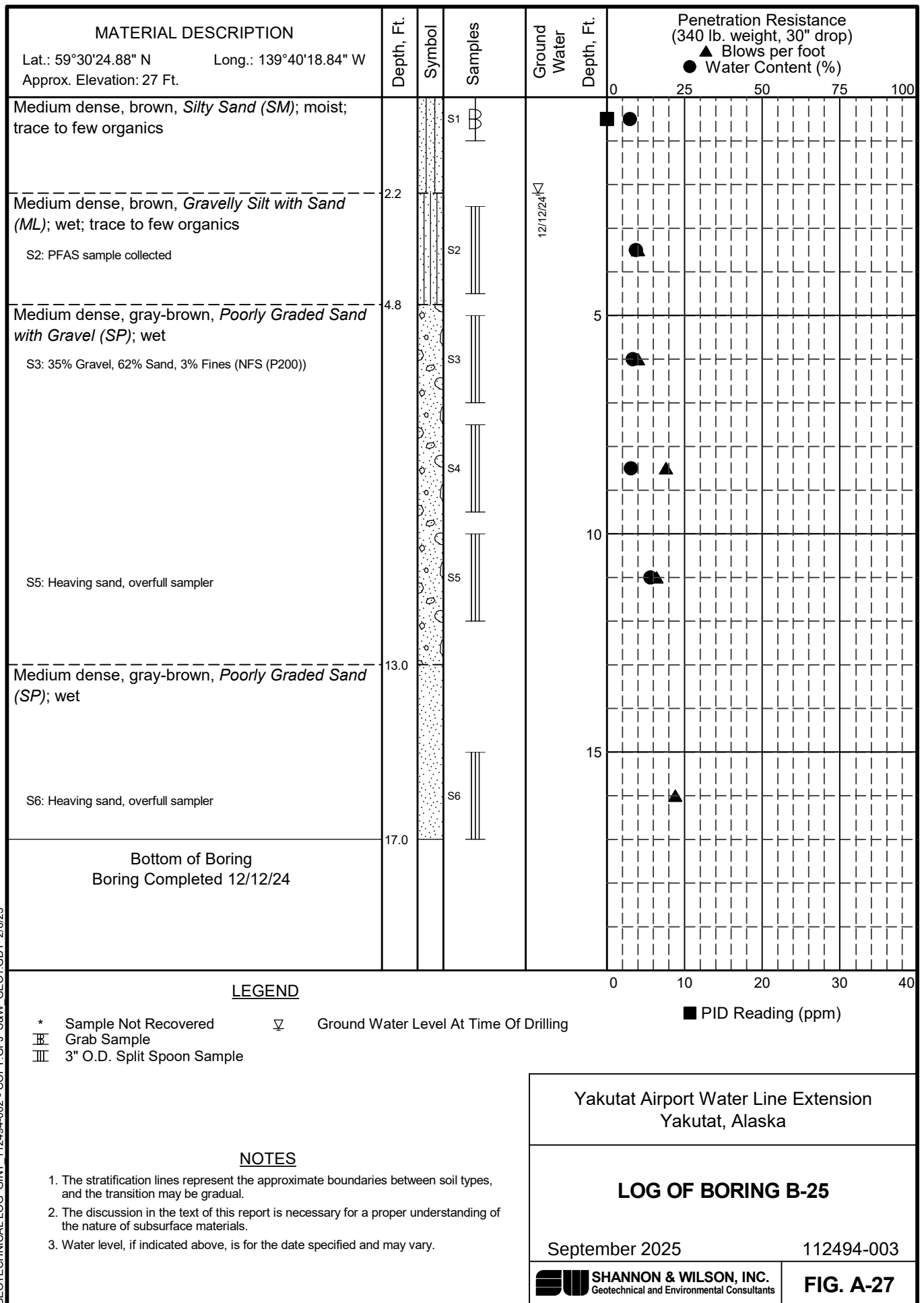


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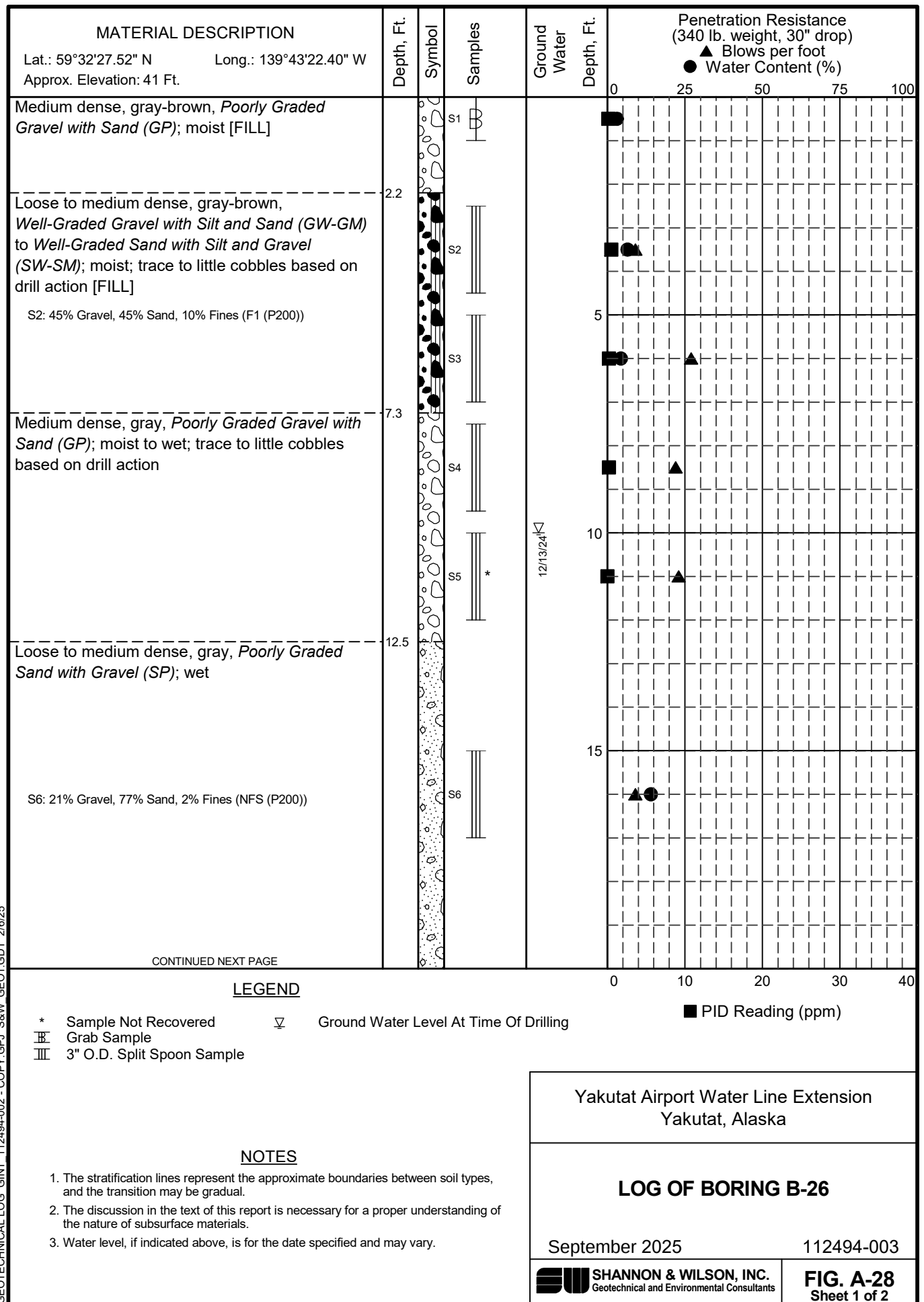




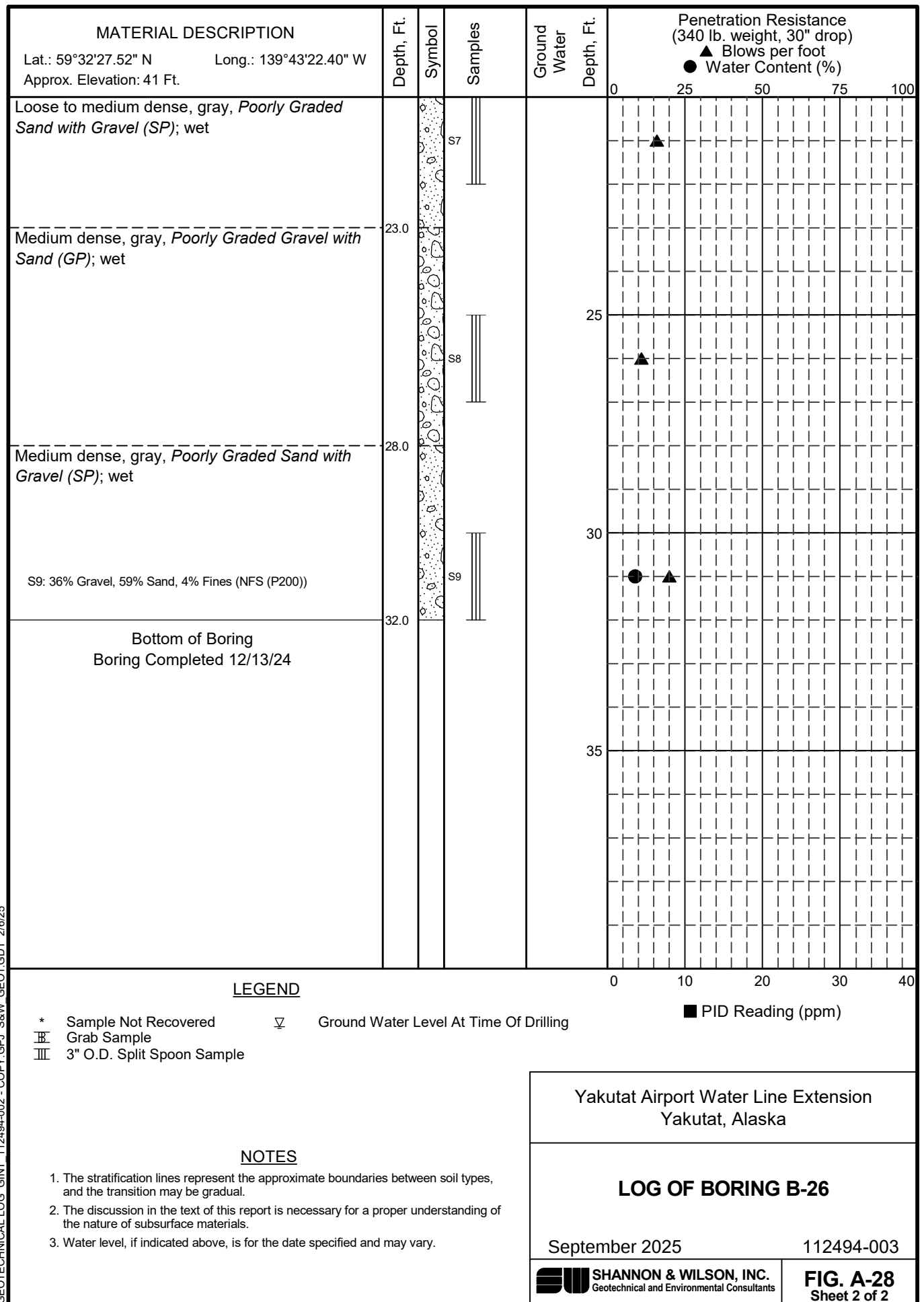
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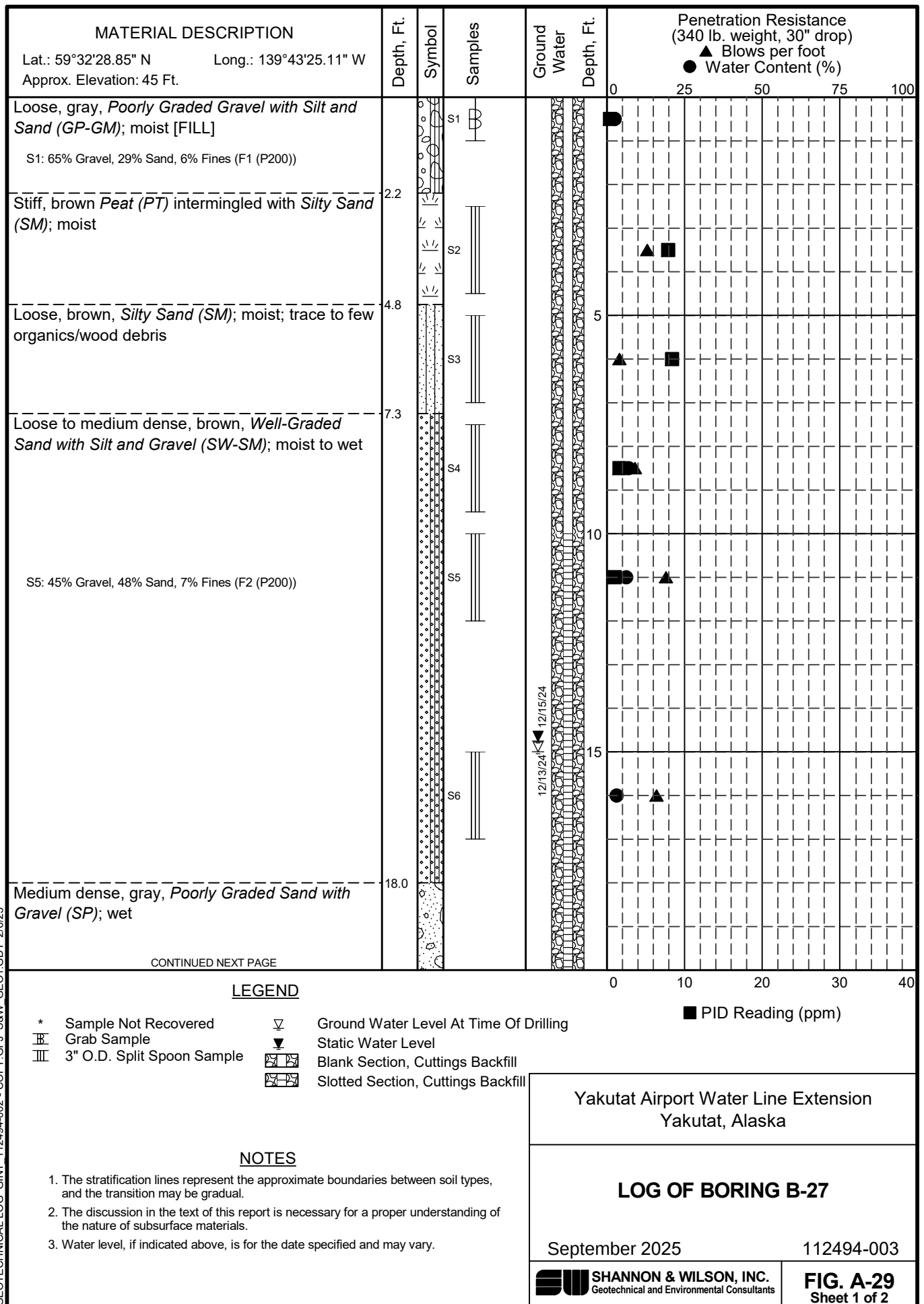
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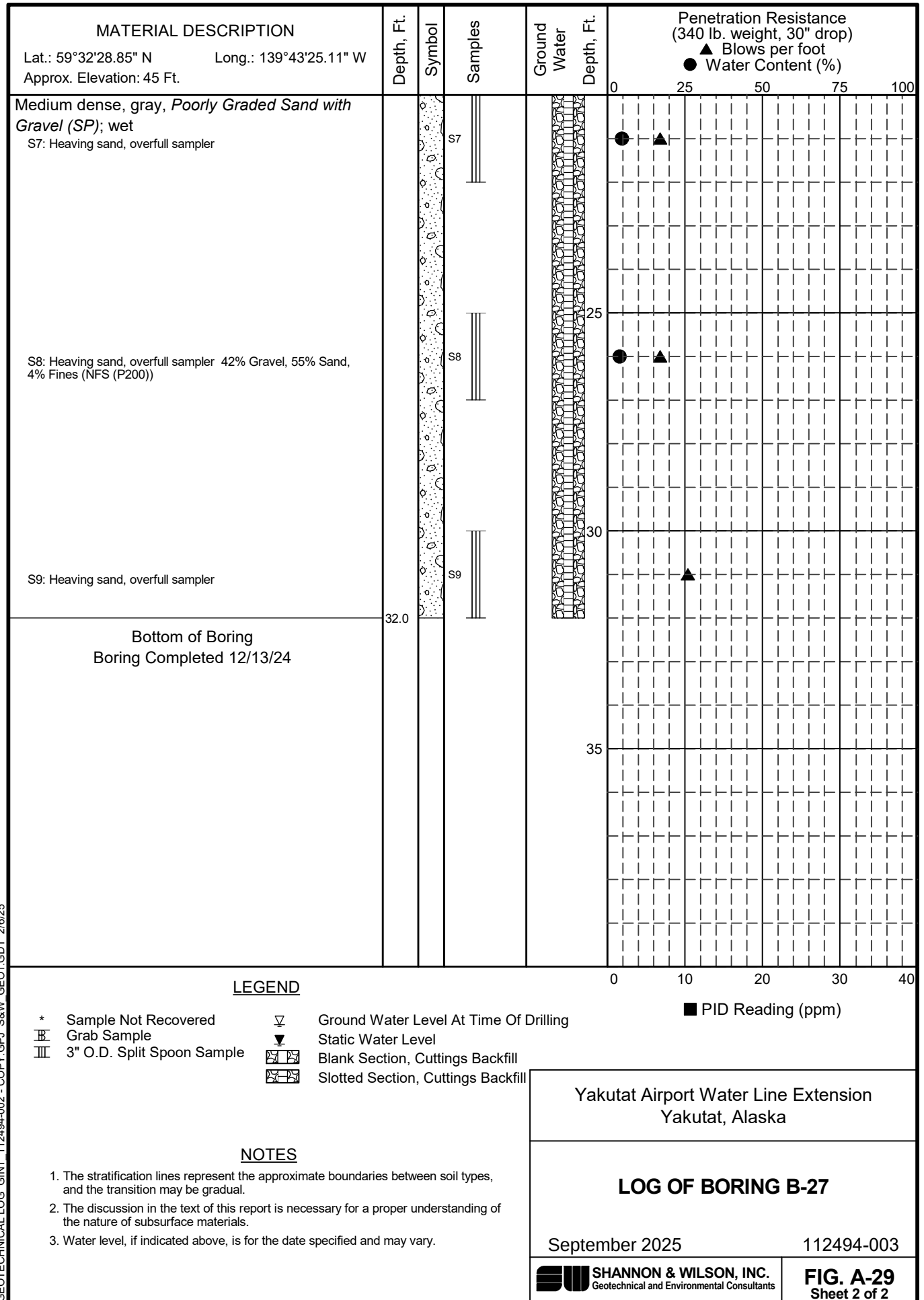


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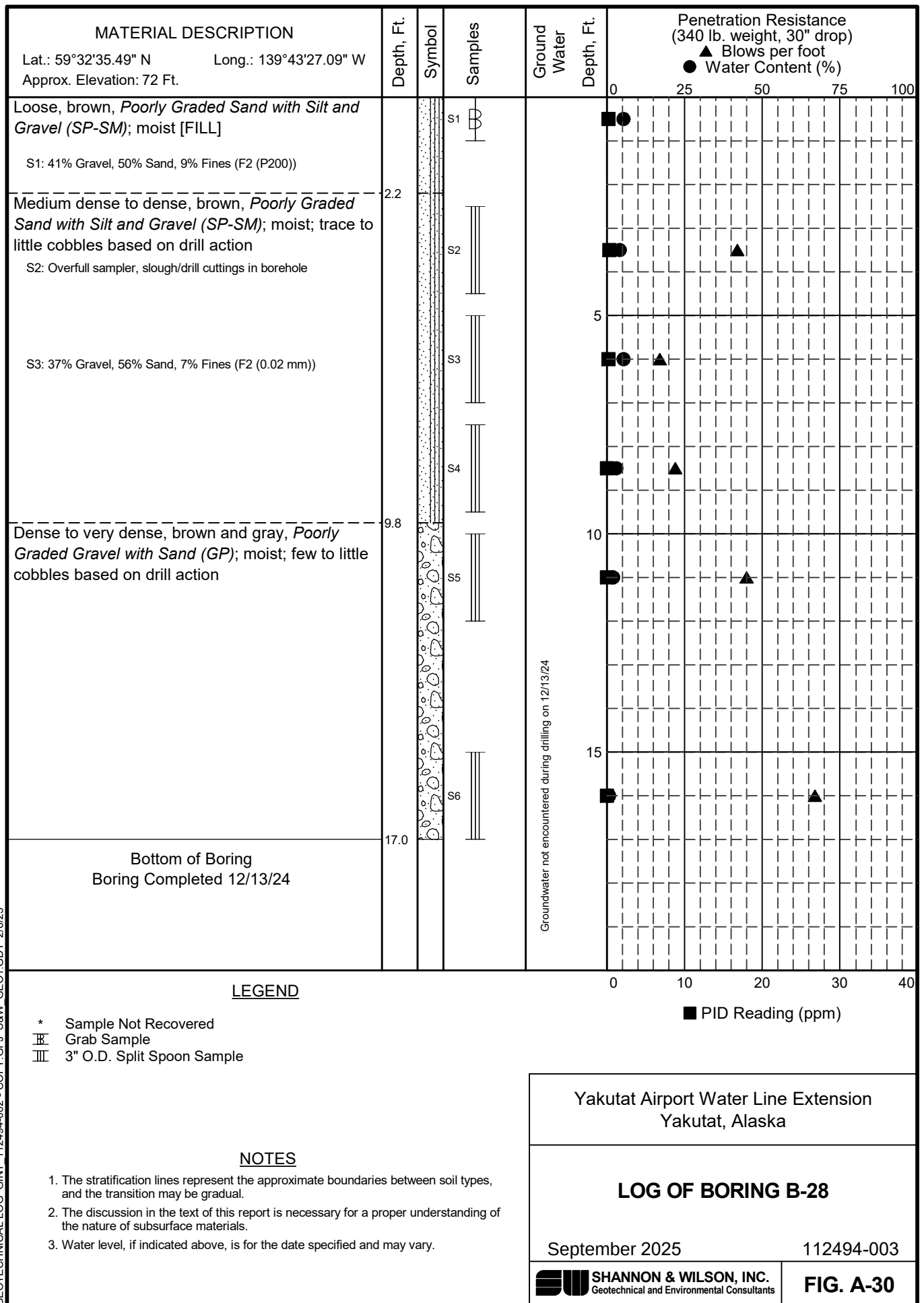
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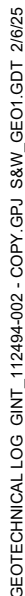




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GEOTECHNICAL LOG GINT 112494-002 - COPY.GPJ S&W GEO1.GDT 2/6/25





Version 1.0 - FINAL

Appendix B

Field Forms

CONTENTS

- Sample Collection Log
- Temporary Well Point Development and Sampling Log

APPENDIX B: FIELD FORMS

QC: _____

TEMPORARY WELL POINT DEVELOPMENT AND SAMPLING LOG

Owner/Client Yakutat Water Line
 Location B-1
 Sampling Personnel LDH
 Weather Conditions Rain Air Temp. (°F) 35°F

Project No. 112494-006
 Date 12/6/24
 TWP ID B-1
 Time started 0840
 Time completed 1105

Sample No. B-1 Time 1040
 Duplicate _____ Time _____
 Equipment Blank _____ Time _____

Purging Method Submersible Pump
 Pumping Start 0905
 Purge Rate (gal./min.) 0.3
 Pumping End 1047

Diameter and Type of Casing 2" PVC
 TOC to GS (ft.) 2.44
 Depth of Well Below TOC (ft.) 63.15
 Depth to Water Below TOC (ft.) 11.30
 Feet of Water in Well 51.85
 Gallons per foot 0.17
 Gallons in Well 8.87
 Purge Water Volume (gal.) 26.43

Pump Set Depth Below TOC (ft.) 60.0
 KuriTec Tubing (ft.) 65
 TruPoly Tubing (ft.) 0
 Silicone Tubing (ft.) 0

Purge Water Disposal Purge to ground surface

Field Parameter Instrument _____ Circle one: Parameters stabilized or 3 well volumes purged

Sample Observations Clear

Locate Survey (GPS) / Field Maps / Swingties (circle one)
 (If locate is not known, take one.)

☐ Well Development Log Complete (see back page)

FIELD PARAMETERS

Time	Temp. °C [± 3%/0.2]	Dissolved Oxygen (mg/L) [± 10%/0.1 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
<u>Parameters not required for this project</u>						

Laboratory Eurolins Environmental Testing

Analysis	Sample Containers	Preservatives	Dup	E.B.
☐ VOC EPA 8260			☐	☐
☐ GRO AK101	<u>Refer to COC</u>		☐	☐
☐ DRO/RRO AK102/103			☐	☐
☐ PAH 8270 SIM			☐	☐
☐ Metals EPA 200.8			☐	☐

WELL CASING VOLUMES

Casing Diameter	SP16 (0.65")	0.75"	1"	1.25"	<u>2</u>	3	4
Gallons per lineal foot	0.02	0.02	0.04	0.08	<u>0.17</u>	0.38	0.65

TOC = top of casing, GS = ground surface, TWP = temporary well point

QC: _____

TWP ID: B-1

Appendix C

Eurofins – Sacramento Laboratory Report and LDRC

CONTENTS

- Eurofins – Sacramento Laboratory Report 320-117793-1
- DEC Laboratory Data Review Checklist for WO 320-117793-1

ANALYTICAL REPORT

PREPARED FOR

Attn: Ashley Jaramillo
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Generated 12/26/2024 2:43:36 PM

JOB DESCRIPTION

YAK Waterline

JOB NUMBER

320-117793-1

Eurofins Sacramento

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization



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12/26/2024 2:43:36 PM

Authorized for release by
David Alltucker, Project Manager I
David.Alltucker@et.eurofinsus.com
(916)374-4383

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Shannon & Wilson, Inc
Project: YAK Waterline

Job ID: 320-117793-1

Job ID: 320-117793-1

Eurofins Sacramento

Job Narrative 320-117793-1

Receipt

The samples were received on 12/18/2024 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.6° C.

Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): B-21 (320-117793-2). The container label lists the following time: 10:45. The samples were logged in and labeled according to the COC.

LCMS

Method 1633: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 320-823489 and analytical batch 320-823858 recovered outside control limits for the following analytes: Nonafluoro-3,6-dioxaheptanoic acid (NFDHA).

Method EPA 537(Mod): The "I" qualifier means the transition mass ratio for the indicated analyte was outside the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. The associated analyte(s) have been flagged: B-22 (320-117793-3) and (320-117793-A-1-C MSD).

Method EPA 537(Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: B-20 (320-117793-1) and (320-117793-A-1-B MS). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 1633: The following sample in preparation batch 320-823489 was observed to have a thin layer of sediment present in the bottom of the bottle prior to extraction: B-1 (320-117793-7).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-20

Lab Sample ID: 320-117793-1

No Detections.

Client Sample ID: B-21

Lab Sample ID: 320-117793-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.29		0.23	0.058	ug/Kg	1	☆	EPA 537(Mod)	Total/NA

Client Sample ID: B-22

Lab Sample ID: 320-117793-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.093	J I	0.23	0.057	ug/Kg	1	☆	EPA 537(Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.42		0.23	0.057	ug/Kg	1	☆	EPA 537(Mod)	Total/NA

Client Sample ID: B-23

Lab Sample ID: 320-117793-4

No Detections.

Client Sample ID: B-24

Lab Sample ID: 320-117793-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.29		0.22	0.055	ug/Kg	1	☆	EPA 537(Mod)	Total/NA

Client Sample ID: B-25

Lab Sample ID: 320-117793-6

No Detections.

Client Sample ID: B-1

Lab Sample ID: 320-117793-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.4	J	3.2	0.80	ng/L	1		1633	Total/NA
Perfluorooctanoic acid (PFOA)	0.47	J	1.6	0.40	ng/L	1		1633	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.0	J	1.6	0.40	ng/L	1		1633	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-20

Lab Sample ID: 320-117793-1

Date Collected: 12/12/24 09:42

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 81.7

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluoroheptanoic acid (PFHpA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.23	0.057	ug/Kg	☼	12/20/24 04:07	12/23/24 22:30	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	77		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C4 PFHpA	74		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C4 PFOA	74		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C5 PFNA	81		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C2 PFDA	80		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C2 PFUnA	81		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C2 PFDoA	74		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C2 PFTeDA	40	*5-	50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C3 PFBS	70		50 - 150	12/20/24 04:07	12/23/24 22:30	1
18O2 PFHxS	75		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C4 PFOS	74		50 - 150	12/20/24 04:07	12/23/24 22:30	1
d3-NMeFOSAA	69		50 - 150	12/20/24 04:07	12/23/24 22:30	1
d5-NEtFOSAA	67		50 - 150	12/20/24 04:07	12/23/24 22:30	1
13C3 HFPO-DA	64		50 - 150	12/20/24 04:07	12/23/24 22:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	18.3		0.1	0.1	%			12/19/24 14:00	1
Percent Solids (ASTM D 2216)	81.7		0.1	0.1	%			12/19/24 14:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-21

Lab Sample ID: 320-117793-2

Date Collected: 12/12/24 10:46

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 84.4

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluoroheptanoic acid (PFHpA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Perfluorooctanesulfonic acid (PFOS)	0.29		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.23	0.058	ug/Kg	☆	12/20/24 04:07	12/23/24 23:12	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C4 PFHpA	88		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C4 PFOA	88		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C5 PFNA	92		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C2 PFDA	87		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C2 PFUnA	84		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C2 PFDoA	79		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C2 PFTeDA	73		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C3 PFBS	82		50 - 150	12/20/24 04:07	12/23/24 23:12	1
18O2 PFHxS	89		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C4 PFOS	86		50 - 150	12/20/24 04:07	12/23/24 23:12	1
d3-NMeFOSAA	66		50 - 150	12/20/24 04:07	12/23/24 23:12	1
d5-NEtFOSAA	63		50 - 150	12/20/24 04:07	12/23/24 23:12	1
13C3 HFPO-DA	82		50 - 150	12/20/24 04:07	12/23/24 23:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	15.6		0.1	0.1	%			12/19/24 14:00	1
Percent Solids (ASTM D 2216)	84.4		0.1	0.1	%			12/19/24 14:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-22

Lab Sample ID: 320-117793-3

Date Collected: 12/12/24 11:42

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 86.9

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluoroheptanoic acid (PFHpA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorohexanesulfonic acid (PFHxS)	0.093	J I	0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Perfluorooctanesulfonic acid (PFOS)	0.42		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.23	0.057	ug/Kg	✱	12/20/24 04:07	12/23/24 23:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C4 PFHpA	95		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C4 PFOA	94		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C5 PFNA	95		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C2 PFDA	85		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C2 PFUnA	83		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C2 PFDoA	78		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C2 PFTeDA	80		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C3 PFBS	88		50 - 150	12/20/24 04:07	12/23/24 23:26	1
18O2 PFHxS	97		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C4 PFOS	85		50 - 150	12/20/24 04:07	12/23/24 23:26	1
d3-NMeFOSAA	63		50 - 150	12/20/24 04:07	12/23/24 23:26	1
d5-NEtFOSAA	65		50 - 150	12/20/24 04:07	12/23/24 23:26	1
13C3 HFPO-DA	89		50 - 150	12/20/24 04:07	12/23/24 23:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	13.1		0.1	0.1	%			12/19/24 14:00	1
Percent Solids (ASTM D 2216)	86.9		0.1	0.1	%			12/19/24 14:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-23

Lab Sample ID: 320-117793-4

Date Collected: 12/12/24 12:55

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 85.1

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.054	ug/Kg	☼	12/20/24 04:07	12/23/24 23:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	84		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C4 PFHpA	81		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C4 PFOA	83		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C5 PFNA	87		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C2 PFDA	85		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C2 PFUnA	84		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C2 PFDoA	75		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C2 PFTeDA	71		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C3 PFBS	80		50 - 150	12/20/24 04:07	12/23/24 23:40	1
18O2 PFHxS	88		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C4 PFOS	86		50 - 150	12/20/24 04:07	12/23/24 23:40	1
d3-NMeFOSAA	65		50 - 150	12/20/24 04:07	12/23/24 23:40	1
d5-NEtFOSAA	64		50 - 150	12/20/24 04:07	12/23/24 23:40	1
13C3 HFPO-DA	74		50 - 150	12/20/24 04:07	12/23/24 23:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	14.9		0.1	0.1	%			12/19/24 14:00	1
Percent Solids (ASTM D 2216)	85.1		0.1	0.1	%			12/19/24 14:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-24

Lab Sample ID: 320-117793-5

Date Collected: 12/12/24 15:05

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 86.2

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Perfluorooctanesulfonic acid (PFOS)	0.29		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.055	ug/Kg	✱	12/20/24 04:07	12/23/24 23:54	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C4 PFHpA	89		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C4 PFOA	87		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C5 PFNA	88		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C2 PFDA	83		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C2 PFUnA	84		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C2 PFDoA	82		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C2 PFTeDA	79		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C3 PFBS	88		50 - 150	12/20/24 04:07	12/23/24 23:54	1
18O2 PFHxS	95		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C4 PFOS	85		50 - 150	12/20/24 04:07	12/23/24 23:54	1
d3-NMeFOSAA	63		50 - 150	12/20/24 04:07	12/23/24 23:54	1
d5-NEtFOSAA	66		50 - 150	12/20/24 04:07	12/23/24 23:54	1
13C3 HFPO-DA	82		50 - 150	12/20/24 04:07	12/23/24 23:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	13.8		0.1	0.1	%			12/19/24 14:00	1
Percent Solids (ASTM D 2216)	86.2		0.1	0.1	%			12/19/24 14:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-25

Lab Sample ID: 320-117793-6

Date Collected: 12/12/24 16:05

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 80.4

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorooctanoic acid (PFOA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.24	0.061	ug/Kg	☼	12/20/24 04:07	12/24/24 00:08	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C4 PFHpA	86		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C4 PFOA	85		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C5 PFNA	86		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C2 PFDA	82		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C2 PFUnA	80		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C2 PFDoA	72		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C2 PFTeDA	69		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C3 PFBS	81		50 - 150	12/20/24 04:07	12/24/24 00:08	1
18O2 PFHxS	89		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C4 PFOS	86		50 - 150	12/20/24 04:07	12/24/24 00:08	1
d3-NMeFOSAA	59		50 - 150	12/20/24 04:07	12/24/24 00:08	1
d5-NEtFOSAA	61		50 - 150	12/20/24 04:07	12/24/24 00:08	1
13C3 HFPO-DA	81		50 - 150	12/20/24 04:07	12/24/24 00:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	19.6		0.1	0.1	%			12/19/24 14:00	1
Percent Solids (ASTM D 2216)	80.4		0.1	0.1	%			12/19/24 14:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-1

Lab Sample ID: 320-117793-7

Date Collected: 12/10/24 10:40

Matrix: Water

Date Received: 12/18/24 10:00

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.4	J	3.2	0.80	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoropentanoic acid (PFPeA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorohexanoic acid (PFHxA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoroheptanoic acid (PFHpA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorooctanoic acid (PFOA)	0.47	J	1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorononanoic acid (PFNA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.44	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorotridecanoic acid (PFTTrDA)	ND		1.6	0.47	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorotetradecanoic acid (PFTeDA)	ND		1.6	0.65	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoropentanesulfonic acid (PFPeS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	J	1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorononanesulfonic acid (PFNS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorododecanesulfonic acid (PFDoS)	ND		1.6	0.43	ng/L		12/20/24 07:16	12/22/24 02:16	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		3.2	0.80	ng/L		12/20/24 07:16	12/22/24 02:16	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		3.2	0.80	ng/L		12/20/24 07:16	12/22/24 02:16	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		3.2	0.80	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		8.0	2.0	ng/L		12/20/24 07:16	12/22/24 02:16	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		8.0	2.0	ng/L		12/20/24 07:16	12/22/24 02:16	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		1.2	0.31	ng/L		12/20/24 07:16	12/22/24 02:16	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	*1	1.6	0.58	ng/L		12/20/24 07:16	12/22/24 02:16	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	ND		1.6	0.47	ng/L		12/20/24 07:16	12/22/24 02:16	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-1

Lab Sample ID: 320-117793-7

Date Collected: 12/10/24 10:40

Matrix: Water

Date Received: 12/18/24 10:00

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	ND		1.6	0.40	ng/L		12/20/24 07:16	12/22/24 02:16	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		3.2	0.80	ng/L		12/20/24 07:16	12/22/24 02:16	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		8.0	2.0	ng/L		12/20/24 07:16	12/22/24 02:16	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		8.0	2.0	ng/L		12/20/24 07:16	12/22/24 02:16	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	111		5 - 130				12/20/24 07:16	12/22/24 02:16	1
13C5 PFPeA	92.5		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C5 PFHxA	88.3		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C4 PFHpA	96.4		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C8 PFOA	97.4		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C9 PFNA	97.2		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C6 PFDA	97.1		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C7 PFUnA	104		30 - 130				12/20/24 07:16	12/22/24 02:16	1
13C2 PFDoA	84.2		10 - 130				12/20/24 07:16	12/22/24 02:16	1
13C2 PFTeDA	78.6		10 - 130				12/20/24 07:16	12/22/24 02:16	1
13C3 PFBS	92.4		40 - 135				12/20/24 07:16	12/22/24 02:16	1
13C3 PFHxS	94.9		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C8 PFOS	91.3		40 - 130				12/20/24 07:16	12/22/24 02:16	1
13C8 FOSA	88.3		40 - 130				12/20/24 07:16	12/22/24 02:16	1
d3-NMeFOSAA	87.8		40 - 170				12/20/24 07:16	12/22/24 02:16	1
d5-NEtFOSAA	89.6		25 - 135				12/20/24 07:16	12/22/24 02:16	1
13C2 4:2 FTS	91.1		40 - 200				12/20/24 07:16	12/22/24 02:16	1
13C2 6:2 FTS	111		40 - 200				12/20/24 07:16	12/22/24 02:16	1
13C2 8:2 FTS	90.0		40 - 300				12/20/24 07:16	12/22/24 02:16	1
13C3 HFPO-DA	85.4		40 - 130				12/20/24 07:16	12/22/24 02:16	1
d7-N-MeFOSE-M	65.6		10 - 130				12/20/24 07:16	12/22/24 02:16	1
d9-N-EtFOSE-M	61.7		10 - 130				12/20/24 07:16	12/22/24 02:16	1
d5-NEtPFOSA	68.0		10 - 130				12/20/24 07:16	12/22/24 02:16	1
d3-NMePFOSA	78.4		10 - 130				12/20/24 07:16	12/22/24 02:16	1

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFBA (5-130)	PFPeA (40-130)	13C5PHA (40-130)	C4PFHA (40-130)	C8PFOA (40-130)	C9PFNA (40-130)	C6PFDA (40-130)	13C7PUA (30-130)
320-117793-7	B-1	111	92.5	88.3	96.4	97.4	97.2	97.1	104
LCS 320-823489/3-A	Lab Control Sample	100	96.0	94.2	85.4	99.5	84.0	92.9	92.9
LCSD 320-823489/4-A	Lab Control Sample Dup	110	101	103	108	95.4	95.3	97.3	100
LLCS 320-823489/2-A	Lab Control Sample	110	103	101	107	96.7	88.3	97.1	90.6
MB 320-823489/1-A	Method Blank	95.6	97.8	101	94.4	98.3	86.6	99.3	87.1

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFDaA (10-130)	PFTDA (10-130)	C3PFBS (40-135)	C3PFHS (40-130)	C8PFOS (40-130)	PFOSA (40-130)	d3NMFOS (40-170)	d5NEFOS (25-135)
320-117793-7	B-1	84.2	78.6	92.4	94.9	91.3	88.3	87.8	89.6
LCS 320-823489/3-A	Lab Control Sample	83.6	81.6	87.2	88.2	92.8	85.0	86.9	88.5
LCSD 320-823489/4-A	Lab Control Sample Dup	87.2	85.8	107	97.6	106	90.9	101	89.5
LLCS 320-823489/2-A	Lab Control Sample	85.6	81.5	93.1	91.1	97.0	91.6	95.5	84.4
MB 320-823489/1-A	Method Blank	80.3	73.6	90.9	89.4	96.5	85.6	87.2	85.2

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M242FTS (40-200)	M262FTS (40-200)	M282FTS (40-300)	HFPODA (40-130)	NMFM (10-130)	NEFM (10-130)	d5NPFSA (10-130)	d3NMFSA (10-130)
320-117793-7	B-1	91.1	111	90.0	85.4	65.6	61.7	68.0	78.4
LCS 320-823489/3-A	Lab Control Sample	100	87.5	78.0	89.5	77.4	70.8	77.6	79.6
LCSD 320-823489/4-A	Lab Control Sample Dup	105	97.9	85.5	95.5	73.5	67.5	77.9	84.2
LLCS 320-823489/2-A	Lab Control Sample	109	112	80.3	99.7	73.7	66.5	75.1	76.8
MB 320-823489/1-A	Method Blank	112	101	79.3	90.9	71.6	67.2	63.7	70.4

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
13C5PHA = 13C5 PFHxA
C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C9PFNA = 13C9 PFNA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
C3PFHS = 13C3 PFHxS
C8PFOS = 13C8 PFOS
PFOSA = 13C8 FOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
M242FTS = 13C2 4:2 FTS
M262FTS = 13C2 6:2 FTS
M282FTS = 13C2 8:2 FTS
HFPODA = 13C3 HFPO-DA
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (50-150)	C4PFHA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)	PFUnA (50-150)	PFDaA (50-150)	PFTDA (50-150)
320-117793-1	B-20	77	74	74	81	80	81	74	40 *5-
320-117793-1 MS	B-20	92	84	84	90	86	85	75	43 *5-
320-117793-1 MSD	B-20	89	83	84	91	90	90	87	59
320-117793-2	B-21	93	88	88	92	87	84	79	73
320-117793-3	B-22	102	95	94	95	85	83	78	80
320-117793-4	B-23	84	81	83	87	85	84	75	71
320-117793-5	B-24	97	89	87	88	83	84	82	79
320-117793-6	B-25	90	86	85	86	82	80	72	69
LCS 320-823451/2-A	Lab Control Sample	94	88	88	92	88	86	82	83
MB 320-823451/1-A	Method Blank	99	94	94	95	90	85	77	83

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	C3PFBS (50-150)	PFHxS (50-150)	PFOS (50-150)	d3NMFOS (50-150)	d5NEFOS (50-150)	HFPODA (50-150)
320-117793-1	B-20	70	75	74	69	67	64
320-117793-1 MS	B-20	77	84	79	65	59	76
320-117793-1 MSD	B-20	83	87	87	76	73	75
320-117793-2	B-21	82	89	86	66	63	82
320-117793-3	B-22	88	97	85	63	65	89
320-117793-4	B-23	80	88	86	65	64	74
320-117793-5	B-24	88	95	85	63	66	82
320-117793-6	B-25	81	89	86	59	61	81
LCS 320-823451/2-A	Lab Control Sample	84	91	89	66	64	85
MB 320-823451/1-A	Method Blank	88	96	90	66	69	89

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Lab Sample ID: MB 320-823489/1-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 823489

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		4.0	1.0	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorotridecanoic acid (PFTTrDA)	ND		2.0	0.58	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorotetradecanoic acid (PFTeDA)	ND		2.0	0.81	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoropentanesulfonic acid (PFPeS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoroheptanesulfonic acid (PFHpS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorononanesulfonic acid (PFNS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorododecanesulfonic acid (PFDoS)	ND		2.0	0.53	ng/L		12/20/24 07:16	12/21/24 19:41	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	ND		4.0	1.0	ng/L		12/20/24 07:16	12/21/24 19:41	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	ND		4.0	1.0	ng/L		12/20/24 07:16	12/21/24 19:41	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	ND		4.0	1.0	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	ND		10	2.5	ng/L		12/20/24 07:16	12/21/24 19:41	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	ND		10	2.5	ng/L		12/20/24 07:16	12/21/24 19:41	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		1.5	0.39	ng/L		12/20/24 07:16	12/21/24 19:41	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND		2.0	0.72	ng/L		12/20/24 07:16	12/21/24 19:41	1
9-Chlorohexadecafluoro-3-oxanonan e-1-sulfonic acid (9Cl-PF3ONS)	ND		2.0	0.58	ng/L		12/20/24 07:16	12/21/24 19:41	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: MB 320-823489/1-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 823489

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecan e-1-sulfonic acid (11Cl-PF3OUdS)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	ND		2.0	0.50	ng/L		12/20/24 07:16	12/21/24 19:41	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	ND		4.0	1.0	ng/L		12/20/24 07:16	12/21/24 19:41	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	ND		10	2.5	ng/L		12/20/24 07:16	12/21/24 19:41	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	ND		10	2.5	ng/L		12/20/24 07:16	12/21/24 19:41	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	95.6		5 - 130	12/20/24 07:16	12/21/24 19:41	1
13C5 PFPeA	97.8		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C5 PFHxA	101		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C4 PFHpA	94.4		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C8 PFOA	98.3		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C9 PFNA	86.6		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C6 PFDA	99.3		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C7 PFUnA	87.1		30 - 130	12/20/24 07:16	12/21/24 19:41	1
13C2 PFDoA	80.3		10 - 130	12/20/24 07:16	12/21/24 19:41	1
13C2 PFTeDA	73.6		10 - 130	12/20/24 07:16	12/21/24 19:41	1
13C3 PFBS	90.9		40 - 135	12/20/24 07:16	12/21/24 19:41	1
13C3 PFHxS	89.4		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C8 PFOS	96.5		40 - 130	12/20/24 07:16	12/21/24 19:41	1
13C8 FOSA	85.6		40 - 130	12/20/24 07:16	12/21/24 19:41	1
d3-NMeFOSAA	87.2		40 - 170	12/20/24 07:16	12/21/24 19:41	1
d5-NEtFOSAA	85.2		25 - 135	12/20/24 07:16	12/21/24 19:41	1
13C2 4:2 FTS	112		40 - 200	12/20/24 07:16	12/21/24 19:41	1
13C2 6:2 FTS	101		40 - 200	12/20/24 07:16	12/21/24 19:41	1
13C2 8:2 FTS	79.3		40 - 300	12/20/24 07:16	12/21/24 19:41	1
13C3 HFPO-DA	90.9		40 - 130	12/20/24 07:16	12/21/24 19:41	1
d7-N-MeFOSE-M	71.6		10 - 130	12/20/24 07:16	12/21/24 19:41	1
d9-N-EtFOSE-M	67.2		10 - 130	12/20/24 07:16	12/21/24 19:41	1
d5-NEtPFOSA	63.7		10 - 130	12/20/24 07:16	12/21/24 19:41	1
d3-NMePFOSA	70.4		10 - 130	12/20/24 07:16	12/21/24 19:41	1

Lab Sample ID: LCS 320-823489/3-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	80.0	75.4		ng/L		94	70 - 140
Perfluoropentanoic acid (PFPeA)	40.0	40.5		ng/L		101	65 - 135
Perfluorohexanoic acid (PFHxA)	40.0	41.1		ng/L		103	70 - 145
Perfluoroheptanoic acid (PFHpA)	40.0	45.7		ng/L		114	70 - 150
Perfluorooctanoic acid (PFOA)	40.0	43.4		ng/L		108	70 - 150
Perfluorononanoic acid (PFNA)	40.0	49.3		ng/L		123	70 - 150
Perfluorodecanoic acid (PFDA)	40.0	37.4		ng/L		94	70 - 140

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 320-823489/3-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA)	40.0	42.0		ng/L		105	70 - 145
Perfluorododecanoic acid (PFDoA)	40.0	44.7		ng/L		112	70 - 140
Perfluorotridecanoic acid (PFTrDA)	40.0	41.7		ng/L		104	65 - 140
Perfluorotetradecanoic acid (PFTeDA)	40.0	35.1		ng/L		88	60 - 140
Perfluorobutanesulfonic acid (PFBS)	35.5	37.8		ng/L		106	60 - 145
Perfluoropentanesulfonic acid (PFPeS)	37.6	40.5		ng/L		108	65 - 140
Perfluorohexanesulfonic acid (PFHxS)	36.5	36.0		ng/L		99	65 - 145
Perfluoroheptanesulfonic acid (PFHpS)	38.2	40.4		ng/L		106	70 - 150
Perfluorooctanesulfonic acid (PFOS)	37.2	35.0		ng/L		94	55 - 150
Perfluorononanesulfonic acid (PFNS)	38.5	40.2		ng/L		105	65 - 145
Perfluorodecanesulfonic acid (PFDS)	38.6	38.8		ng/L		101	60 - 145
Perfluorododecanesulfonic acid (PFDoS)	38.8	36.7		ng/L		95	50 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	75.0	74.8		ng/L		100	70 - 145
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	76.2	67.0		ng/L		88	65 - 155
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	76.8	82.8		ng/L		108	60 - 150
Perfluorooctanesulfonamide (PFOSA)	40.0	38.6		ng/L		97	70 - 145
N-methylperfluorooctane sulfonamide (NMeFOSA)	40.0	43.3		ng/L		108	60 - 150
N-ethylperfluorooctane sulfonamide (NEtFOSA)	40.0	40.6		ng/L		101	65 - 145
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	40.2		ng/L		100	50 - 140
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	41.9		ng/L		105	70 - 145
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	200	186		ng/L		93	70 - 145
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	200	185		ng/L		92	70 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	30.0	29.1		ng/L		97	70 - 140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	39.4		ng/L		104	65 - 145
Perfluoro-3-methoxypropanoic acid (PFMPA)	40.0	42.5		ng/L		106	55 - 140
Perfluoro-4-methoxybutanoic acid (PFMBA)	40.0	45.3		ng/L		113	60 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	40.0	38.1		ng/L		95	50 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 320-823489/3-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	37.4	38.1		ng/L		102	70 - 155
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	37.8	37.6		ng/L		99	55 - 160
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	35.7	35.9		ng/L		101	70 - 140
3-Perfluoropropylpropanoic acid (3:3 FTCA)	80.0	91.7		ng/L		115	65 - 130
3-Perfluoropentylpropanoic acid (5:3 FTCA)	200	194		ng/L		97	70 - 135
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	200	177		ng/L		89	50 - 145

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	100		5 - 130
13C5 PFPeA	96.0		40 - 130
13C5 PFHxA	94.2		40 - 130
13C4 PFHpA	85.4		40 - 130
13C8 PFOA	99.5		40 - 130
13C9 PFNA	84.0		40 - 130
13C6 PFDA	92.9		40 - 130
13C7 PFUnA	92.9		30 - 130
13C2 PFDoA	83.6		10 - 130
13C2 PFTeDA	81.6		10 - 130
13C3 PFBS	87.2		40 - 135
13C3 PFHxS	88.2		40 - 130
13C8 PFOS	92.8		40 - 130
13C8 FOSA	85.0		40 - 130
d3-NMeFOSAA	86.9		40 - 170
d5-NEtFOSAA	88.5		25 - 135
13C2 4:2 FTS	100		40 - 200
13C2 6:2 FTS	87.5		40 - 200
13C2 8:2 FTS	78.0		40 - 300
13C3 HFPO-DA	89.5		40 - 130
d7-N-MeFOSE-M	77.4		10 - 130
d9-N-EtFOSE-M	70.8		10 - 130
d5-NEtPFOSA	77.6		10 - 130
d3-NMePFOSA	79.6		10 - 130

Lab Sample ID: LCSD 320-823489/4-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Perfluorobutanoic acid (PFBA)	80.0	75.2		ng/L		94	70 - 140	0	30
Perfluoropentanoic acid (PFPeA)	40.0	39.0		ng/L		98	65 - 135	4	30
Perfluorohexanoic acid (PFHxA)	40.0	45.8		ng/L		114	70 - 145	11	30
Perfluoroheptanoic acid (PFHpA)	40.0	37.1		ng/L		93	70 - 150	21	30
Perfluorooctanoic acid (PFOA)	40.0	45.6		ng/L		114	70 - 150	5	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCSD 320-823489/4-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorononanoic acid (PFNA)	40.0	42.6		ng/L		106	70 - 150	15	30
Perfluorodecanoic acid (PFDA)	40.0	41.7		ng/L		104	70 - 140	11	30
Perfluoroundecanoic acid (PFUnA)	40.0	41.0		ng/L		103	70 - 145	2	30
Perfluorododecanoic acid (PFDoA)	40.0	44.4		ng/L		111	70 - 140	1	30
Perfluorotridecanoic acid (PFTrDA)	40.0	41.2		ng/L		103	65 - 140	1	30
Perfluorotetradecanoic acid (PFTeDA)	40.0	40.5		ng/L		101	60 - 140	14	30
Perfluorobutanesulfonic acid (PFBS)	35.5	31.4		ng/L		88	60 - 145	18	30
Perfluoropentanesulfonic acid (PFPeS)	37.6	43.4		ng/L		115	65 - 140	7	30
Perfluorohexanesulfonic acid (PFHxS)	36.5	34.5		ng/L		95	65 - 145	4	30
Perfluoroheptanesulfonic acid (PFHpS)	38.2	38.7		ng/L		101	70 - 150	4	30
Perfluorooctanesulfonic acid (PFOS)	37.2	34.8		ng/L		94	55 - 150	1	30
Perfluorononanesulfonic acid (PFNS)	38.5	35.6		ng/L		93	65 - 145	12	30
Perfluorodecanesulfonic acid (PFDS)	38.6	35.8		ng/L		93	60 - 145	8	30
Perfluorododecanesulfonic acid (PFDoS)	38.8	34.3		ng/L		88	50 - 145	7	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	75.0	81.2		ng/L		108	70 - 145	8	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	76.2	71.3		ng/L		94	65 - 155	6	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	76.8	70.4		ng/L		92	60 - 150	16	30
Perfluorooctanesulfonamide (PFOSA)	40.0	38.0		ng/L		95	70 - 145	2	30
N-methylperfluorooctane sulfonamide (NMeFOSA)	40.0	41.9		ng/L		105	60 - 150	3	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)	40.0	40.0		ng/L		100	65 - 145	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	39.6		ng/L		99	50 - 140	2	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	41.3		ng/L		103	70 - 145	1	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	200	195		ng/L		98	70 - 145	5	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	200	194		ng/L		97	70 - 135	5	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	30.0	29.5		ng/L		98	70 - 140	1	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	37.6		ng/L		99	65 - 145	5	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	40.0	46.3		ng/L		116	55 - 140	9	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	40.0	37.9		ng/L		95	60 - 150	18	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCSD 320-823489/4-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nonafluoro-3,6-dioxahheptanoic acid (NFDHA)	40.0	54.9	*1	ng/L		137	50 - 150	36	30
9-Chlorohexadecafluoro-3-oxan onane-1-sulfonic acid (9CI-PF3ONS)	37.4	39.9		ng/L		107	70 - 155	5	30
11-Chloroeicosafluoro-3-oxaund ecane-1-sulfonic acid (11CI-PF3OUdS)	37.8	41.2		ng/L		109	55 - 160	9	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	35.7	37.9		ng/L		106	70 - 140	6	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)	80.0	93.8		ng/L		117	65 - 130	2	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)	200	199		ng/L		100	70 - 135	3	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	200	178		ng/L		89	50 - 145	1	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFBA	110		5 - 130
13C5 PFPeA	101		40 - 130
13C5 PFHxA	103		40 - 130
13C4 PFHpA	108		40 - 130
13C8 PFOA	95.4		40 - 130
13C9 PFNA	95.3		40 - 130
13C6 PFDA	97.3		40 - 130
13C7 PFUnA	100		30 - 130
13C2 PFDoA	87.2		10 - 130
13C2 PFTeDA	85.8		10 - 130
13C3 PFBS	107		40 - 135
13C3 PFHxS	97.6		40 - 130
13C8 PFOS	106		40 - 130
13C8 FOSA	90.9		40 - 130
d3-NMeFOSAA	101		40 - 170
d5-NEtFOSAA	89.5		25 - 135
13C2 4:2 FTS	105		40 - 200
13C2 6:2 FTS	97.9		40 - 200
13C2 8:2 FTS	85.5		40 - 300
13C3 HFPO-DA	95.5		40 - 130
d7-N-MeFOSE-M	73.5		10 - 130
d9-N-EtFOSE-M	67.5		10 - 130
d5-NEtPFOSA	77.9		10 - 130
d3-NMePFOSA	84.2		10 - 130

Lab Sample ID: LLCS 320-823489/2-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	8.00	7.38		ng/L		92	70 - 140
Perfluoropentanoic acid (PFPeA)	4.00	4.47		ng/L		112	65 - 135
Perfluorohexanoic acid (PFHxA)	4.00	4.72		ng/L		118	70 - 145

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 320-823489/2-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroheptanoic acid (PFHpA)	4.00	4.08		ng/L		102	70 - 150
Perfluorooctanoic acid (PFOA)	4.00	4.38		ng/L		109	70 - 150
Perfluorononanoic acid (PFNA)	4.00	4.79		ng/L		120	70 - 150
Perfluorodecanoic acid (PFDA)	4.00	4.13		ng/L		103	70 - 140
Perfluoroundecanoic acid (PFUnA)	4.00	4.53		ng/L		113	70 - 145
Perfluorododecanoic acid (PFDoA)	4.00	4.10		ng/L		103	70 - 140
Perfluorotridecanoic acid (PFTrDA)	4.00	4.26		ng/L		106	65 - 140
Perfluorotetradecanoic acid (PFTeDA)	4.00	4.05		ng/L		101	60 - 140
Perfluorobutanesulfonic acid (PFBS)	3.55	3.74		ng/L		105	60 - 145
Perfluoropentanesulfonic acid (PFPeS)	3.76	4.18		ng/L		111	65 - 140
Perfluorohexanesulfonic acid (PFHxS)	3.65	3.64		ng/L		100	65 - 145
Perfluoroheptanesulfonic acid (PFHpS)	3.82	4.10		ng/L		107	70 - 150
Perfluorooctanesulfonic acid (PFOS)	3.72	3.90		ng/L		105	55 - 150
Perfluorononanesulfonic acid (PFNS)	3.85	3.98		ng/L		104	65 - 145
Perfluorodecanesulfonic acid (PFDS)	3.86	3.63		ng/L		94	60 - 145
Perfluorododecanesulfonic acid (PFDoS)	3.88	3.39		ng/L		87	50 - 145
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	7.50	6.89		ng/L		92	70 - 145
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	7.62	6.76		ng/L		89	65 - 155
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	7.68	7.79		ng/L		101	60 - 150
Perfluorooctanesulfonamide (PFOSA)	4.00	3.67		ng/L		92	70 - 145
N-methylperfluorooctane sulfonamide (NMeFOSA)	4.00	4.10		ng/L		102	60 - 150
N-ethylperfluorooctane sulfonamide (NEtFOSA)	4.00	3.98		ng/L		100	65 - 145
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	4.00	4.00		ng/L		100	50 - 140
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.00	4.42		ng/L		110	70 - 145
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	20.0	19.7		ng/L		98	70 - 145
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	20.0	19.1		ng/L		95	70 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	3.00	2.93		ng/L		98	70 - 140
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	3.78	4.10		ng/L		108	65 - 145
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.00	4.20		ng/L		105	55 - 140

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 320-823489/2-A

Matrix: Water

Analysis Batch: 823858

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823489

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.00	3.92		ng/L		98	60 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	4.00	4.15		ng/L		104	50 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	3.74	3.57		ng/L		95	70 - 155
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	3.78	3.84		ng/L		102	55 - 160
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	3.57	3.79		ng/L		106	70 - 140
3-Perfluoropropylpropanoic acid (3:3 FTCA)	8.00	8.13		ng/L		102	65 - 130
3-Perfluoropentylpropanoic acid (5:3 FTCA)	20.0	18.8		ng/L		94	70 - 135
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	20.0	17.4		ng/L		87	50 - 145

Isotope Dilution	LLCS %Recovery	LLCS Qualifier	Limits
13C4 PFBA	110		5 - 130
13C5 PFPeA	103		40 - 130
13C5 PFHxA	101		40 - 130
13C4 PFHpA	107		40 - 130
13C8 PFOA	96.7		40 - 130
13C9 PFNA	88.3		40 - 130
13C6 PFDA	97.1		40 - 130
13C7 PFUnA	90.6		30 - 130
13C2 PFDoA	85.6		10 - 130
13C2 PFTeDA	81.5		10 - 130
13C3 PFBS	93.1		40 - 135
13C3 PFHxS	91.1		40 - 130
13C8 PFOS	97.0		40 - 130
13C8 FOSA	91.6		40 - 130
d3-NMeFOSAA	95.5		40 - 170
d5-NEtFOSAA	84.4		25 - 135
13C2 4:2 FTS	109		40 - 200
13C2 6:2 FTS	112		40 - 200
13C2 8:2 FTS	80.3		40 - 300
13C3 HFPO-DA	99.7		40 - 130
d7-N-MeFOSE-M	73.7		10 - 130
d9-N-EtFOSE-M	66.5		10 - 130
d5-NEtPFOSA	75.1		10 - 130
d3-NMePFOSA	76.8		10 - 130

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Lab Sample ID: MB 320-823451/1-A

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 823451

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.050	ug/Kg		12/20/24 04:07	12/23/24 22:02	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	99		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C4 PFHpA	94		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C4 PFOA	94		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C5 PFNA	95		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C2 PFDA	90		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C2 PFUnA	85		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C2 PFDoA	77		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C2 PFTeDA	83		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C3 PFBS	88		50 - 150	12/20/24 04:07	12/23/24 22:02	1
18O2 PFHxS	96		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C4 PFOS	90		50 - 150	12/20/24 04:07	12/23/24 22:02	1
d3-NMeFOSAA	66		50 - 150	12/20/24 04:07	12/23/24 22:02	1
d5-NEtFOSAA	69		50 - 150	12/20/24 04:07	12/23/24 22:02	1
13C3 HFPO-DA	89		50 - 150	12/20/24 04:07	12/23/24 22:02	1

Lab Sample ID: LCS 320-823451/2-A

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823451

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.82		ug/Kg		91	70 - 132
Perfluoroheptanoic acid (PFHpA)	2.00	1.92		ug/Kg		96	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.95		ug/Kg		98	69 - 133
Perfluorononanoic acid (PFNA)	2.00	1.94		ug/Kg		97	72 - 129

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15 (Continued)

Lab Sample ID: LCS 320-823451/2-A

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 823451

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorodecanoic acid (PFDA)	2.00	1.96		ug/Kg		98	69 - 133
Perfluoroundecanoic acid (PFUnA)	2.00	2.06		ug/Kg		103	64 - 136
Perfluorododecanoic acid (PFDoA)	2.00	2.04		ug/Kg		102	69 - 135
Perfluorotridecanoic acid (PFTriA)	2.00	2.20		ug/Kg		110	66 - 139
Perfluorotetradecanoic acid (PFTeA)	2.00	1.94		ug/Kg		97	69 - 133
Perfluorobutanesulfonic acid (PFBS)	1.78	1.73		ug/Kg		97	72 - 128
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.79		ug/Kg		98	67 - 130
Perfluorooctanesulfonic acid (PFOS)	1.86	1.82		ug/Kg		98	68 - 136
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.98		ug/Kg		99	63 - 144
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.91		ug/Kg		95	61 - 139
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.87	1.83		ug/Kg		98	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	1.85		ug/Kg		93	77 - 137
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.89	1.81		ug/Kg		96	76 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.89	1.80		ug/Kg		95	79 - 139

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	94		50 - 150
13C4 PFHpA	88		50 - 150
13C4 PFOA	88		50 - 150
13C5 PFNA	92		50 - 150
13C2 PFDA	88		50 - 150
13C2 PFUnA	86		50 - 150
13C2 PFDoA	82		50 - 150
13C2 PFTeDA	83		50 - 150
13C3 PFBS	84		50 - 150
18O2 PFHxS	91		50 - 150
13C4 PFOS	89		50 - 150
d3-NMeFOSAA	66		50 - 150
d5-NEtFOSAA	64		50 - 150
13C3 HFPO-DA	85		50 - 150

Lab Sample ID: 320-117793-1 MS

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: B-20

Prep Type: Total/NA

Prep Batch: 823451

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	ND		2.35	2.03		ug/Kg	✱	86	70 - 132
Perfluoroheptanoic acid (PFHpA)	ND		2.35	2.23		ug/Kg	✱	95	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.35	2.24		ug/Kg	✱	95	69 - 133

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15 (Continued)

Lab Sample ID: 320-117793-1 MS

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: B-20

Prep Type: Total/NA

Prep Batch: 823451

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorononanoic acid (PFNA)	ND		2.35	2.34		ug/Kg	⚡	99	72 - 129
Perfluorodecanoic acid (PFDA)	ND		2.35	2.26		ug/Kg	⚡	96	69 - 133
Perfluoroundecanoic acid (PFUnA)	ND		2.35	2.53		ug/Kg	⚡	108	64 - 136
Perfluorododecanoic acid (PFDoA)	ND		2.35	2.44		ug/Kg	⚡	104	69 - 135
Perfluorotridecanoic acid (PFTriA)	ND		2.35	1.98		ug/Kg	⚡	84	66 - 139
Perfluorotetradecanoic acid (PFTeA)	ND		2.35	2.27		ug/Kg	⚡	96	69 - 133
Perfluorobutanesulfonic acid (PFBS)	ND		2.09	2.09		ug/Kg	⚡	100	72 - 128
Perfluorohexanesulfonic acid (PFHxS)	ND		2.15	2.17		ug/Kg	⚡	101	67 - 130
Perfluorooctanesulfonic acid (PFOS)	ND		2.19	2.29		ug/Kg	⚡	105	68 - 136
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.35	2.25		ug/Kg	⚡	95	63 - 144
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.35	2.14		ug/Kg	⚡	91	61 - 139
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.20	2.13		ug/Kg	⚡	97	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.35	2.19		ug/Kg	⚡	93	77 - 137
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.22	1.94		ug/Kg	⚡	87	76 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.23	2.21		ug/Kg	⚡	99	79 - 139

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA	92		50 - 150
13C4 PFHpA	84		50 - 150
13C4 PFOA	84		50 - 150
13C5 PFNA	90		50 - 150
13C2 PFDA	86		50 - 150
13C2 PFUnA	85		50 - 150
13C2 PFDoA	75		50 - 150
13C2 PFTeDA	43	*5-	50 - 150
13C3 PFBS	77		50 - 150
18O2 PFHxS	84		50 - 150
13C4 PFOS	79		50 - 150
d3-NMeFOSAA	65		50 - 150
d5-NEtFOSAA	59		50 - 150
13C3 HFPO-DA	76		50 - 150

Lab Sample ID: 320-117793-1 MSD

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: B-20

Prep Type: Total/NA

Prep Batch: 823451

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	ND		2.34	2.06		ug/Kg	⚡	88	70 - 132	1	30
Perfluoroheptanoic acid (PFHpA)	ND		2.34	2.23		ug/Kg	⚡	95	71 - 131	0	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15 (Continued)

Lab Sample ID: 320-117793-1 MSD

Matrix: Solid

Analysis Batch: 823982

Client Sample ID: B-20

Prep Type: Total/NA

Prep Batch: 823451

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	ND		2.34	2.32		ug/Kg	☼	99	69 - 133	4	30
Perfluorononanoic acid (PFNA)	ND		2.34	2.29		ug/Kg	☼	98	72 - 129	2	30
Perfluorodecanoic acid (PFDA)	ND		2.34	2.24		ug/Kg	☼	96	69 - 133	1	30
Perfluoroundecanoic acid (PFUnA)	ND		2.34	2.51		ug/Kg	☼	107	64 - 136	1	30
Perfluorododecanoic acid (PFDoA)	ND		2.34	2.41		ug/Kg	☼	103	69 - 135	1	30
Perfluorotridecanoic acid (PFTriA)	ND		2.34	2.33		ug/Kg	☼	100	66 - 139	17	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.34	2.37		ug/Kg	☼	101	69 - 133	4	30
Perfluorobutanesulfonic acid (PFBS)	ND		2.08	1.94		ug/Kg	☼	93	72 - 128	8	30
Perfluorohexanesulfonic acid (PFHxS)	ND		2.13	2.14	I	ug/Kg	☼	100	67 - 130	1	30
Perfluorooctanesulfonic acid (PFOS)	ND		2.18	2.18		ug/Kg	☼	100	68 - 136	5	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.34	2.29		ug/Kg	☼	98	63 - 144	2	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.34	2.22		ug/Kg	☼	95	61 - 139	4	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.19	2.05		ug/Kg	☼	94	75 - 135	4	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.34	2.22		ug/Kg	☼	95	77 - 137	2	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.21	2.15		ug/Kg	☼	97	76 - 136	10	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.21	2.03		ug/Kg	☼	92	79 - 139	8	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	89		50 - 150
13C4 PFHpA	83		50 - 150
13C4 PFOA	84		50 - 150
13C5 PFNA	91		50 - 150
13C2 PFDA	90		50 - 150
13C2 PFUnA	90		50 - 150
13C2 PFDoA	87		50 - 150
13C2 PFTeDA	59		50 - 150
13C3 PFBS	83		50 - 150
18O2 PFHxS	87		50 - 150
13C4 PFOS	87		50 - 150
d3-NMeFOSAA	76		50 - 150
d5-NEtFOSAA	73		50 - 150
13C3 HFPO-DA	75		50 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method: D 2216 - Percent Moisture

Lab Sample ID: 320-117772-A-1 DU					Client Sample ID: Duplicate				
Matrix: Solid					Prep Type: Total/NA				
Analysis Batch: 823360									
Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D		RPD	RPD Limit
Percent Moisture	21.7		21.0		%			3	20
Percent Solids	78.3		79.0		%			0.9	20

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

LCMS

Prep Batch: 823451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-117793-1	B-20	Total/NA	Solid	SHAKE	
320-117793-2	B-21	Total/NA	Solid	SHAKE	
320-117793-3	B-22	Total/NA	Solid	SHAKE	
320-117793-4	B-23	Total/NA	Solid	SHAKE	
320-117793-5	B-24	Total/NA	Solid	SHAKE	
320-117793-6	B-25	Total/NA	Solid	SHAKE	
MB 320-823451/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-823451/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-117793-1 MS	B-20	Total/NA	Solid	SHAKE	
320-117793-1 MSD	B-20	Total/NA	Solid	SHAKE	

Prep Batch: 823489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-117793-7	B-1	Total/NA	Water	1633	
MB 320-823489/1-A	Method Blank	Total/NA	Water	1633	
LCS 320-823489/3-A	Lab Control Sample	Total/NA	Water	1633	
LCSD 320-823489/4-A	Lab Control Sample Dup	Total/NA	Water	1633	
LLCS 320-823489/2-A	Lab Control Sample	Total/NA	Water	1633	

Analysis Batch: 823858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-117793-7	B-1	Total/NA	Water	1633	823489
MB 320-823489/1-A	Method Blank	Total/NA	Water	1633	823489
LCS 320-823489/3-A	Lab Control Sample	Total/NA	Water	1633	823489
LCSD 320-823489/4-A	Lab Control Sample Dup	Total/NA	Water	1633	823489
LLCS 320-823489/2-A	Lab Control Sample	Total/NA	Water	1633	823489

Analysis Batch: 823982

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-117793-1	B-20	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-2	B-21	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-3	B-22	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-4	B-23	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-5	B-24	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-6	B-25	Total/NA	Solid	EPA 537(Mod)	823451
MB 320-823451/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	823451
LCS 320-823451/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-1 MS	B-20	Total/NA	Solid	EPA 537(Mod)	823451
320-117793-1 MSD	B-20	Total/NA	Solid	EPA 537(Mod)	823451

General Chemistry

Analysis Batch: 823360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-117793-1	B-20	Total/NA	Solid	D 2216	
320-117793-2	B-21	Total/NA	Solid	D 2216	
320-117793-3	B-22	Total/NA	Solid	D 2216	
320-117793-4	B-23	Total/NA	Solid	D 2216	
320-117793-5	B-24	Total/NA	Solid	D 2216	
320-117793-6	B-25	Total/NA	Solid	D 2216	
320-117772-A-1 DU	Duplicate	Total/NA	Solid	D 2216	

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-20

Lab Sample ID: 320-117793-1

Date Collected: 12/12/24 09:42

Matrix: Solid

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			823360	12/19/24 14:00	CFR	EET SAC

Client Sample ID: B-20

Lab Sample ID: 320-117793-1

Date Collected: 12/12/24 09:42

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 81.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.34 g	10.0 mL	823451	12/20/24 04:07	R1T	EET SAC
Total/NA	Analysis	EPA 537(Mod)		1	1 mL	1 mL	823982	12/23/24 22:30	N1K	EET SAC

Client Sample ID: B-21

Lab Sample ID: 320-117793-2

Date Collected: 12/12/24 10:46

Matrix: Solid

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			823360	12/19/24 14:00	CFR	EET SAC

Client Sample ID: B-21

Lab Sample ID: 320-117793-2

Date Collected: 12/12/24 10:46

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 84.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.08 g	10.0 mL	823451	12/20/24 04:07	R1T	EET SAC
Total/NA	Analysis	EPA 537(Mod)		1	1 mL	1 mL	823982	12/23/24 23:12	N1K	EET SAC

Client Sample ID: B-22

Lab Sample ID: 320-117793-3

Date Collected: 12/12/24 11:42

Matrix: Solid

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			823360	12/19/24 14:00	CFR	EET SAC

Client Sample ID: B-22

Lab Sample ID: 320-117793-3

Date Collected: 12/12/24 11:42

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 86.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.02 g	10.0 mL	823451	12/20/24 04:07	R1T	EET SAC
Total/NA	Analysis	EPA 537(Mod)		1	1 mL	1 mL	823982	12/23/24 23:26	N1K	EET SAC

Client Sample ID: B-23

Lab Sample ID: 320-117793-4

Date Collected: 12/12/24 12:55

Matrix: Solid

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			823360	12/19/24 14:00	CFR	EET SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Client Sample ID: B-23

Lab Sample ID: 320-117793-4

Date Collected: 12/12/24 12:55

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 85.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.45 g	10.0 mL	823451	12/20/24 04:07	R1T	EET SAC
Total/NA	Analysis	EPA 537(Mod)		1	1 mL	1 mL	823982	12/23/24 23:40	N1K	EET SAC

Client Sample ID: B-24

Lab Sample ID: 320-117793-5

Date Collected: 12/12/24 15:05

Matrix: Solid

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			823360	12/19/24 14:00	CFR	EET SAC

Client Sample ID: B-24

Lab Sample ID: 320-117793-5

Date Collected: 12/12/24 15:05

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 86.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.29 g	10.0 mL	823451	12/20/24 04:07	R1T	EET SAC
Total/NA	Analysis	EPA 537(Mod)		1	1 mL	1 mL	823982	12/23/24 23:54	N1K	EET SAC

Client Sample ID: B-25

Lab Sample ID: 320-117793-6

Date Collected: 12/12/24 16:05

Matrix: Solid

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			823360	12/19/24 14:00	CFR	EET SAC

Client Sample ID: B-25

Lab Sample ID: 320-117793-6

Date Collected: 12/12/24 16:05

Matrix: Solid

Date Received: 12/18/24 10:00

Percent Solids: 80.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.12 g	10.0 mL	823451	12/20/24 04:07	R1T	EET SAC
Total/NA	Analysis	EPA 537(Mod)		1	1 mL	1 mL	823982	12/24/24 00:08	N1K	EET SAC

Client Sample ID: B-1

Lab Sample ID: 320-117793-7

Date Collected: 12/10/24 10:40

Matrix: Water

Date Received: 12/18/24 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1633			155.6 mL	5.0 mL	823489	12/20/24 07:16	CGL	EET SAC
Total/NA	Analysis	1633		1			823858	12/22/24 02:16	RS1	EET SAC

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Eurofins Sacramento

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-27

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Method	Method Description	Protocol	Laboratory
1633	Per- and Polyfluoroalkyl Substances by LC/MS/MS	EPA	EET SAC
EPA 537(Mod)	PFAS for QSM 5.3, Table B-15	EPA	EET SAC
D 2216	Percent Moisture	ASTM	EET SAC
1633	Solid-Phase Extraction (SPE)	EPA	EET SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	EET SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: YAK Waterline

Job ID: 320-117793-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-117793-1	B-20	Solid	12/12/24 09:42	12/18/24 10:00
320-117793-2	B-21	Solid	12/12/24 10:46	12/18/24 10:00
320-117793-3	B-22	Solid	12/12/24 11:42	12/18/24 10:00
320-117793-4	B-23	Solid	12/12/24 12:55	12/18/24 10:00
320-117793-5	B-24	Solid	12/12/24 15:05	12/18/24 10:00
320-117793-6	B-25	Solid	12/12/24 16:05	12/18/24 10:00
320-117793-7	B-1	Water	12/10/24 10:40	12/18/24 10:00



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Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Environ Page 1 of 1
Attn David Affinch
(narrative if used)

Analytical Methods (include preservative if used)

Turn Around Time:	☒ Normal ☐ Rush	Quote No:
		MSA No:
	Please Specify	J-Flags: ☒ Yes ☐ No

	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
DFAA (633)		
PFAA (537M)		

B-20	0942	12/42/24								1	50.1
B-21	1046									1	
B-22	1142									1	
B-23	1255									1	
B-24	1505									1	
B-25	1605									1	
B-1	1070	12/10/24	X							3	Water

Project Information		Sample Receipt	
Number	112494-006	Total No of Containers:	
Name	YAK Waterline	COC Seals/Intact?	Y/N/A
Contact	AMJ	Received Good Cond./Cold	
Ongoing Project?	Yes ☐ No ☒	Temp	
Sampler	LDW	Delivery Method	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature _____ Printed Name _____ Company _____	Signature _____ Printed Name _____ Company _____	Signature _____ Printed Name _____ Company _____
Time: 10/3/12 Date: 12/16	Time: _____ Date: _____	Time: _____ Date: _____
Lucas Bradley Lucas Bradley Shannon Wilson	_____ _____ _____	_____ _____ _____
Signature _____ Printed Name _____ Company _____	Signature _____ Printed Name _____ Company _____	Signature _____ Printed Name _____ Company _____
Time: 10/00 Date: 12/16	Time: _____ Date: _____	Time: _____ Date: _____
_____ _____ _____	_____ _____ _____	_____ _____ _____

320-117793 Chain of Custody

Distribution White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - Shannon & Wilson - job file



Environment Testing

Sacramento Sample
Receiving Notes (SSRN)

Loc: 320

117793

Tracking #

5881 5597 9661

Job _____

SO (PO) FO / SAT / 2-Day / Ground / UPS / CDO / Courier
GSL / OnTrac / Goldstreak / USPS / Other _____Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations
File in the job folder with the COCTherm ID 112 Corr Factor: (+/-) _____ °CIce _____ Wet _____ Gel ☒ Other _____Cooler Custody Seal. 2551414 / 2551415

Cooler ID _____

Temp Observed: 5.6 °C Corrected: 5.6 °CFrom Temp Blank ☐ Sandwich ☒ Sidewall ☐**Opening/Processing The Shipment**

	Yes	No	NA
Cooler compromised/tampered with?	☐	☒	☐
Cooler Temperature is acceptable?	☒	☐	☐
Frozen samples show signs of thaw?	☐	☐	☒

Initials me Date 12/18/24**Unpacking/Labeling The Samples**

	Yes	No	NA
Containers are not broken or leaking?	☒	☐	☐
Samples compromised/tampered with?	☐	☒	☐
COC is complete w/o discrepancies	☒	☐	☐
Sample custody seal?	☐	☐	☒
Sample containers have legible labels?	☒	☐	☐
Sample date/times are provided?	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Is the Field Sampler's name on COC?	☐	☐	☒
Samples w/o discrepancies?	☐	☒	☐
Zero headspace?*	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
Perchlorate has headspace? (Methods 314, 331, 6850)	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Initials DM Date 12/18/24Notes: Sample time for
sample # 2? 10:45

Trizma Lot #(s) _____

Ammonium

Acetate Lot #(s) _____

Login Completion

	Yes	No	NA
Receipt Temperature on COC?	☒	☐	☐
NCM Filed?	☒	☐	☐
Samples received within hold time?	☒	☐	☐
Log Release checked in TALS?	☒	☐	☐

Initials DM Date 12/18/24

ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Amber Masters	CS Site Name:	ADOT&PF Yakutat Airport Sitewide PFAS	Lab Name:	Eurofins - Sacramento
Title:	Environmental Scientist	ADEC File No.:	1530.38.022	Lab Report No.:	320-117793-1
Consulting Firm:	Shannon & Wilson, Inc.	Hazard ID No.:	27090	Lab Report Date:	12/26/2024

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?

Yes ☒ No ☐ N/A ☐

Comments: Project samples were sent to Eurofins Sacramento (Eurofins) in West Sacramento, California. Eurofins analyzed project samples for PFAS by method EPA 1633 and EPA method 537(Mod) under DEC approval 17-020 issued 2/21/2024 with an expiration of 2/20/2027.

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?

Yes ☐ No ☐ N/A ☒

Comments: Samples were not transferred to another “network” laboratory or sub-contracted to an alternate laboratory.

2. Chain of Custody (CoC)

- a. Is the CoC information completed, signed, and dated (including released/received by)?

Yes ☒ No ☐ N/A ☐

Comments:

- b. Were the correct analyses requested?

Yes ☒ No ☐ N/A ☐

Analyses requested: PFAS by EPA 537 (modified) (soil samples), and PFAS by EPA 1633 (water samples).

Comments:

3. Laboratory Sample Receipt Documentation

- a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐

Cooler temperature(s): Cooler temperature was not reported by the laboratory.

Sample temperature(s): Sample temperatures were not noted by the laboratory.

Comments: A temperature blank was included with the samples in the cooler and is used to access temperature preservation. The temperature blank was reported at 5.6° C upon arrival at the Eurofins laboratory.

- b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?

Yes ☐ No ☐ N/A ☒

Comments: No preservation (other than chilling) is required for PFAS analysis.

- c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?

Yes ☒ No ☐ N/A ☐

Comments: The laboratory noted that samples were received in good condition.

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?

Yes ☒ No ☐ N/A ☐

Comments: The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): B-21 (320-117793-2). The container label lists the following time: 10:45. The sample was logged in and labeled according to the COC. Data quality and/or usability not affected.

- e. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: See Section 3.d.

4. Case Narrative

- a. Is the case narrative present and understandable?

Yes ☒ No ☐ N/A ☐

Comments: Click or tap here to enter text.

- b. Are there discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐

Comments:

Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): B-21 (320-117793-2). The container label lists

CS Site Name: ADOT&PF Yakutat Airport Sitewide PFAS

Lab Report No.: 320-117793-1

the following time: 10:45. The sample was logged in and labeled according to the COC. Data quality and/or usability not affected.

LCMS

Method 1633: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 320-823489 and analytical batch 320-823858 recovered outside control limits for the following analytes: Nonafluoro-3,6-dioxaheptanoic acid (NFDHA). See Section 6.b. for details regarding impacts on data quality and/or usability, as applicable.

Method EPA 537(Mod): The "I" qualifier means the transition mass ratio for the indicated analyte was outside the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. The associated analyte(s) have been flagged: B-22 (320-117793-3) and (320-117793-A-1-C MSD). Consequently, the PFHxS result in the noted sample is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

Method EPA 537(Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: B-20 (320-117793-1) and (320-117793-A-1-B MS). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). See Section 6.d. for details regarding impacts on data quality and/or usability, as applicable.

Organic Prep

Method 1633: The following sample in preparation batch 320-823489 was observed to have a thin layer of sediment present in the bottom of the bottle prior to extraction: B-1 (320-117793-7). Data quality and/or usability not affected.

- c. Were all the corrective actions documented?

Yes ☐ No ☐ N/A ☒

Comments: Corrective actions not required.

- d. What is the effect on data quality/usability according to the case narrative?

Comments: Effects on data quality and/or usability due to discrepancies, errors, or QC failures identified by the lab are discussed in Section 4.b, or elsewhere in this checklist.

5. Sample Results

- a. Are the correct analyses performed/reported as requested on CoC?

Yes ☒ No ☐ N/A ☐

Comments: Samples were analyzed as requested

CS Site Name: ADOT&PF Yakutat Airport Sitewide PFAS

Lab Report No.: 320-117793-1

- b. Are all applicable holding times met?

Yes ☒ No ☐ N/A ☐

Comments: The samples were received within holding time limits and with sufficient time to meet holding time requirements.

- c. Are all soils reported on a dry weight basis?

Yes ☒ No ☐ N/A ☐

Comments: Soil samples were reported on a dry weight basis.

- d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?

Yes ☒ No ☐ N/A ☐

Comments: For soil samples, analytical sensitivity was evaluated to verify that reporting limits met applicable DEC's most stringent values between the DEC cleanup levels in 18 AAC 75.341 Table B1 and B2 Method Two (Migration to Groundwater or Over 40 Inch Zone Human Health). For the groundwater sample Analytical sensitivity was evaluated to verify that reporting limits met applicable Drinking Water Standards obtained from the EPA PFAS National Primary Drinking Water Regulation dated April 2024.

- e. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: No sample result discrepancies were noted by the laboratory.

6. QC Samples

- a. Method Blank

- i. Was one method blank reported per matrix, analysis, and 20 samples?

Yes ☒ No ☐ N/A ☐

Comments:

- ii. Are all method blank results less than LOQ (or RL)?

Yes ☒ No ☐

Comments: Target analytes were not detected in the method blanks associated with this work order

- iii. If above LoQ or RL, what samples are affected?

Comments: N/A; target analytes were not detected in the method blanks.

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments: Project analytes were not detected in the method blanks.

v. Data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: Project analytes were not detected in the method blanks.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – Are 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: An LCS sample was reported for PFAS 537(mod). LLCS and LCSD samples were reported for PFAS 1633. An LCSD was not reported for method PFAS 537(Mod). Refer to MS/MSD results for the quality assessment of accuracy and precision.

ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments: Metals analysis was not requested with this work order.

iii. Accuracy – Are 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 percent recoveries are reported within quality control limits.

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the 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: LCS/LCSD precision was outside the data quality objective for NFDHA by method 1633. NFDHA was not detected in the associated project sample B-1. Consequently, the NFDHA result in the noted sample is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: See Section 6.b.iv. for affected samples.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

CS Site Name: ADOT&PF Yakutat Airport Sitewide PFAS

Lab Report No.: 320-117793-1

Yes ☒ No ☐ N/A ☐

Comments: See 6.b.iv. for applied qualifiers.

vii. Is the data quality or usability affected?

Yes ☒ No ☐ N/A ☐

Comments: See 6.b.iv., above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: An MS/MSD was prepared for preparation batch 320-823451 for method 537M.

An MS/MSD was not prepared for method 1633. See section 6.b. for batch accuracy and precision for this preparation batch. Data quality and/or usability not affected.

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments: Metals analysis was not requested with this work order.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐

Comments: All percent recoveries were within quality control limits.

iv. Precision – Are 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: RPDs were within quality control limits.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: N/A; method accuracy and precision were demonstrated to be within laboratory control limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments: Method accuracy and precision were demonstrated to be within laboratory control limits.

vii. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: Method accuracy and precision were demonstrated to be within laboratory control limits.

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: IDA recoveries were reported for this work order.

ii. Accuracy – Are 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: Percent recoveries for 13C2 PFTeDA were below acceptance limits in the MS sample for 537M and the parent sample B-20. The analyte associated with 13C2 PFTeDa is PFTeA. PFTeA was not detected in the parent samples. Consequently, the result of this analyte in the noted sample is considered estimated, no direction of bias, and have been flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

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: See Section 6.d.ii for applied qualifiers.

iv. Is the data quality or usability affected?

Yes ☒ No ☐ N/A ☐

Comments: See 6.d.ii.

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes ☐ No ☐ N/A ☒

Comments: Volatile analyses were not requested; a trip blank was not submitted with this work order.

ii. Are all results less than LoQ or RL?

Yes ☐ No ☐ N/A ☒

Comments: A trip blank was not required.

- iii. If above LoQ or RL, what samples are affected?

Comments: N/A; a trip blank was not required.

- iv. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: A trip blank was not required.

f. Field Duplicate

- i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?

Yes ☐ No ☒ N/A ☐

Comments: Field duplicate samples were inadvertently not collected with this project.

- ii. Was the duplicate submitted blind to lab?

Yes ☐ No ☒ N/A ☐

Comments: Field duplicate samples were inadvertently not collected with this project.

- iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

- iv. Is the data quality or usability affected? (Explain)

Yes ☐ No ☒ N/A ☐

Comments: Field duplicate samples were inadvertently not collected with this project.

g. Decontamination or Equipment Blanks

- i. Were decontamination or equipment blanks collected?

Yes ☐ No ☐ N/A ☒

Comments: Soil samples were not collected with reusable equipment. Cross-contamination is unlikely. The water sample was the only one collected for this project, so no equipment blank was collected.

- ii. Are all results less than LoQ or RL?

Yes ☐ No ☐ N/A ☒

Comments: An equipment blank was not submitted with this work order.

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- iii. If above LoQ or RL, specify what samples are affected.

Comments: N/A; an equipment blank was not submitted with this work order.

- iv. Are data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: Data quality and usability are not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

- a. Are they defined and appropriate?

Yes ☒ No ☐ N/A ☐

Comments: See 4.b., above.

Appendix D

Eurofins – Seattle Laboratory Report
and LDRC

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- Eurofins – Seattle Laboratory Report 580-146688-1
- DEC Laboratory Data Review Checklist for WO 580-146688-1

ANALYTICAL REPORT

PREPARED FOR

Attn: Ashley Jaramillo
Shannon & Wilson, Inc
2355 Hill Rd.

Fairbanks, Alaska 99709-5244

Generated 1/9/2025 6:59:28 AM Revision 1

JOB DESCRIPTION

112494-002 Yakutat Airport Water System

JOB NUMBER

580-146688-1

Eurofins Seattle

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

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Case Narrative

Client: Shannon & Wilson, Inc
Project: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Job ID: 580-146688-1

Eurofins Seattle

Job Narrative 580-146688-1

Revision 1/9/2025

The report was revised to show the correct temperature that the cooler was received. The previous temperature reflected was due to a sample login error.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The sample was received on 12/17/2024 2:49 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.3°C.

Gasoline Range Organics

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS VOA

Method 8260D: The method blank for preparation batch 580-480913 and analytical batch 580-480934 contained 1,2,4-Trimethylbenzene above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

Method 8260D: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 580-480913 and analytical batch 580-480934 recovered outside control limits for the following analytes: Acetone.

Method 8260D_SIM_AK: The continuing calibration verification (CCV) associated with batch 580-481244 recovered outside acceptance criteria, low biased, for Vinyl chloride. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte(s), the data are reported.

Method 8260D_SIM_AK: The continuing calibration verification (CCV) associated with batch 580-481244 recovered above the upper control limit for Naphthalene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: B-23 (580-146688-1) and (CCVIS 580-481244/3).

Method 8260D_SIM_AK: The method blank for preparation batch 580-481242 and analytical batch 580-481244 contained Bromoform, Chlorodibromomethane, Dibromomethane, 1,4-Dichlorobenzene, Dichlorobromomethane, Ethylene Dibromide, Hexachlorobutadiene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, 1,1,2-Trichloroethane and Trichloroethene above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA

Method 8270E_SIM: MB recovered low for 2,4,6-Tribromophenol (Surr). LCS was within limits and samples, barring sample matrix, were passing for this surrogate. (MB 580-480917/1-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics

Method AK102_103: The matrix spike (MS) recoveries for preparation batch 580-480898 and analytical batch 580-481055 were outside control limits. Non-homogeneity is suspected because the associated laboratory control sample (LCS) recovery was within

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Case Narrative

Client: Shannon & Wilson, Inc
Project: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

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acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA

Method 8011: The following sample formed emulsions during the extraction procedure: B-23 (580-146688-1). The emulsions were broken up using centrifuge. 8011.

Method 8011: The continuing calibration verification (CCV) associated with batch 580-481622 recovered above the upper control limit for 1,2,3-Trichloropropane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs

Method 8082A: The continuing calibration verification (CCV) associated with 580-481693 recovered high and outside the control limits for PCB-1221 on one column. Results are confirmed on both columns and reported from the passing column. The associated sample is: (CCV 580-481693/5).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
D	The reported value is from a dilution.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

1

2

3

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Client Sample ID: B-23

Lab Sample ID: 580-146688-1

Date Collected: 12/12/24 13:01

Matrix: Solid

Date Received: 12/17/24 14:49

Percent Solids: 100.0

Method: SW846 8260D SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.00083	J	0.0020	0.00038	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Bromoform	0.00098	U	0.0020	0.00044	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Bromomethane	0.00098	U M	0.0020	0.00029	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Chlorodibromomethane	0.00049	U M	0.0020	0.00022	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Chloroform	0.00044	J M	0.0020	0.00033	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
cis-1,3-Dichloropropene	0.00098	U M	0.0020	0.00053	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Dibromomethane	0.00061	J M	0.0020	0.00047	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
1,4-Dichlorobenzene	0.00098	U M	0.0020	0.00041	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Dichlorobromomethane	0.00049	U	0.0020	0.00023	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
1,2-Dichloroethane	0.00098	U	0.0020	0.00075	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
1,1-Dichloroethene	0.00031	J	0.0020	0.00024	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Ethylene Dibromide	0.0042		0.0020	0.00051	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Hexachlorobutadiene	0.0020	U M	0.0039	0.0012	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
2-Hexanone	0.22		0.014	0.0070	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Naphthalene	0.0020	U Q M	0.0078	0.0014	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
1,1,1,2-Tetrachloroethane	0.00098	U	0.0020	0.00029	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
1,1,1,2,2-Tetrachloroethane	0.00098	U	0.0039	0.00053	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Tetrachloroethene	0.0014	J	0.0020	0.00043	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
trans-1,3-Dichloropropene	0.00040	J	0.0020	0.00037	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
1,1,2-Trichloroethane	0.26	M	0.0020	0.00018	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Trichloroethene	0.00055	J	0.0020	0.00045	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1
Vinyl chloride	0.0020	U Q	0.0078	0.00093	mg/Kg	☆	12/23/24 15:14	12/23/24 22:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107	M	79 - 120	12/23/24 15:14	12/23/24 22:15	1
Dibromofluoromethane (Surr)	100		78 - 120	12/23/24 15:14	12/23/24 22:15	1
1,2-Dichloroethane-d4 (Surr)	104		79 - 121	12/23/24 15:14	12/23/24 22:15	1
Toluene-d8 (Surr)	98		79 - 120	12/23/24 15:14	12/23/24 22:15	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.20	U Q	0.31	0.068	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Bromobenzene	0.0059	U	0.016	0.0016	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
2-Butanone (MEK)	0.059	U	0.16	0.032	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Carbon disulfide	0.011	J	0.023	0.0047	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Carbon tetrachloride	0.0059	U	0.0078	0.0017	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Chlorobenzene	0.0059	U	0.016	0.0019	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Chlorobromomethane	0.0059	U	0.016	0.0024	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Chloroethane	0.029	U	0.031	0.0082	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Chloromethane	0.012	U	0.023	0.0039	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
2-Chlorotoluene	0.012	U	0.016	0.0034	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
4-Chlorotoluene	0.012	U	0.016	0.0038	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
cis-1,2-Dichloroethene	0.012	U	0.023	0.0049	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
1,2-Dibromo-3-Chloropropane	0.012	U	0.023	0.0059	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
1,2-Dichlorobenzene	0.012	U	0.016	0.0034	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
1,3-Dichlorobenzene	0.012	U	0.023	0.0052	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
Dichlorodifluoromethane	0.039	U	0.098	0.018	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
1,1-Dichloroethane	0.012	U	0.016	0.0036	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
1,2-Dichloropropane	0.0059	U	0.0078	0.0026	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1
1,3-Dichloropropane	0.0059	U	0.023	0.0022	mg/Kg	☆	12/19/24 11:47	12/19/24 20:51	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Client Sample ID: B-23

Lab Sample ID: 580-146688-1

Date Collected: 12/12/24 13:01

Matrix: Solid

Date Received: 12/17/24 14:49

Percent Solids: 100.0

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2,2-Dichloropropane	0.012	U	0.016	0.0047	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,1-Dichloropropene	0.0059	U	0.016	0.0021	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Ethylbenzene	0.012	U M	0.016	0.0036	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Isopropylbenzene	0.012	U	0.016	0.0034	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
4-Isopropyltoluene	0.012	U	0.016	0.0040	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Methylene Chloride	0.039	U	0.098	0.010	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
4-Methyl-2-pentanone (MIBK)	0.029	U	0.039	0.0074	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Methyl tert-butyl ether	0.0059	U	0.016	0.0023	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
m-Xylene & p-Xylene	0.0059	U	0.016	0.0028	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
n-Butylbenzene	0.012	U	0.016	0.0072	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
N-Propylbenzene	0.012	U	0.016	0.0059	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
o-Xylene	0.0059	U	0.016	0.0020	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
sec-Butylbenzene	0.012	U	0.016	0.0034	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Styrene	0.012	U	0.016	0.0050	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
tert-Butylbenzene	0.012	U	0.016	0.0030	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Toluene	0.012	U	0.023	0.0053	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
trans-1,2-Dichloroethene	0.012	U	0.023	0.0057	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,2,3-Trichlorobenzene	0.029	U	0.031	0.016	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,2,4-Trichlorobenzene	0.029	U	0.031	0.017	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,1,1-Trichloroethane	0.0059	U	0.016	0.0018	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
Trichlorofluoromethane	0.029	U	0.031	0.010	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,2,3-Trichloropropane	0.012	U	0.016	0.0045	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,2,4-Trimethylbenzene	0.012	U M	0.016	0.0053	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1
1,3,5-Trimethylbenzene	0.012	U	0.016	0.0030	mg/Kg	✱	12/19/24 11:47	12/19/24 20:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	115	M	80 - 120	12/19/24 11:47	12/19/24 20:51	1
Dibromofluoromethane (Surr)	99		80 - 120	12/19/24 11:47	12/19/24 20:51	1
1,2-Dichloroethane-d4 (Surr)	107		80 - 121	12/19/24 11:47	12/19/24 20:51	1
Toluene-d8 (Surr)	81		80 - 120	12/19/24 11:47	12/19/24 20:51	1

Method: ADEC AK101 - Alaska - Gasoline Range Organics (GC/MS) - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	270		48	24	mg/Kg	✱	12/23/24 10:23	12/23/24 13:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	97		50 - 150	12/23/24 10:23	12/23/24 13:29	1
4-Bromofluorobenzene (Surr)	105		50 - 150	12/23/24 10:23	12/23/24 13:29	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0048	U M	0.0053	0.0023	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
2-Methylnaphthalene	0.0048	U M	0.0058	0.0028	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Acenaphthene	0.0048	U M	0.0053	0.0015	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Acenaphthylene	0.0048	U M	0.0053	0.0016	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Anthracene	0.0048	U M	0.0053	0.0018	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Benzo[a]anthracene	0.0048	U	0.0053	0.0021	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Benzo[a]pyrene	0.0048	U M	0.0053	0.0018	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Benzo[b]fluoranthene	0.0029	U	0.0048	0.0011	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Benzo[g,h,i]perylene	0.0048	U	0.0053	0.0017	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Client Sample ID: B-23

Lab Sample ID: 580-146688-1

Date Collected: 12/12/24 13:01

Matrix: Solid

Date Received: 12/17/24 14:49

Percent Solids: 100.0

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[k]fluoranthene	0.0048	U	0.0053	0.0017	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Chrysene	0.0029	U	0.0048	0.0014	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Dibenz(a,h)anthracene	0.0048	U	0.0053	0.00069	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Fluoranthene	0.0029	U M	0.0048	0.0013	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Fluorene	0.0048	U M	0.0053	0.0012	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Indeno[1,2,3-cd]pyrene	0.0048	U M	0.0053	0.0021	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Naphthalene	0.068		0.0048	0.0016	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Phenanthrene	0.0038	U M	0.0048	0.0016	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1
Pyrene	0.0034	J	0.0053	0.0010	mg/Kg	✱	12/19/24 12:49	12/26/24 17:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14	91		57 - 145	12/19/24 12:49	12/26/24 17:27	1

Method: EPA 8011 - EDB and DBCP in Water by Microextraction

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene Dibromide	0.000039	U M	0.000049	0.000012	mg/Kg	✱	12/26/24 13:19	12/30/24 23:09	1
1,2,3-Trichloropropane	0.00016	U M Q	0.00029	0.000065	mg/Kg	✱	12/26/24 13:19	12/30/24 23:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dibromopropane	88		60 - 140	12/26/24 13:19	12/30/24 23:09	1

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.017	U	0.019	0.0072	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1
PCB-1221	0.019	U	0.019	0.012	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1
PCB-1232	0.017	U	0.019	0.0047	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1
PCB-1242	0.017	U	0.019	0.0077	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1
PCB-1248	0.017	U	0.019	0.0068	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1
PCB-1254	0.019	U	0.019	0.0087	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1
PCB-1260	0.017	U	0.019	0.0072	mg/Kg	✱	12/19/24 15:13	01/01/25 00:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	94		44 - 135	12/19/24 15:13	01/01/25 00:47	1
Tetrachloro-m-xylene	75		48 - 150	12/19/24 15:13	01/01/25 00:47	1

Method: ADEC AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	1000	J1	19	8.5	mg/Kg	✱	12/19/24 10:46	12/20/24 20:44	1
RRO (nC25-<nC36)	29	U	48	18	mg/Kg	✱	12/19/24 10:46	12/20/24 20:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	105		50 - 150	12/19/24 10:46	12/20/24 20:44	1
n-Triacontane-d62	84		50 - 150	12/19/24 10:46	12/20/24 20:44	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	2.8	D	0.29	0.062	mg/Kg	✱	12/26/24 13:42	12/27/24 21:56	10

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (SM22 2540G)	100		0.1	0.1	%			12/20/24 11:56	1
Percent Moisture (SM22 2540G)	0.03		0.1	0.1	%			12/20/24 11:56	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-480913/11-A

Matrix: Solid

Analysis Batch: 480934

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 480913

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.50	U	0.80	0.17	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Bromobenzene	0.015	U	0.040	0.0042	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
2-Butanone (MEK)	0.15	U	0.40	0.083	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Carbon disulfide	0.030	U	0.060	0.012	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Carbon tetrachloride	0.015	U	0.020	0.0044	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Chlorobenzene	0.015	U	0.040	0.0048	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Chlorobromomethane	0.015	U	0.040	0.0062	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Chloroethane	0.075	U	0.080	0.021	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Chloromethane	0.030	U	0.060	0.010	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
2-Chlorotoluene	0.030	U	0.040	0.0088	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
4-Chlorotoluene	0.030	U	0.040	0.0098	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
cis-1,2-Dichloroethene	0.030	U	0.060	0.013	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2-Dibromo-3-Chloropropane	0.030	U	0.060	0.015	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2-Dichlorobenzene	0.030	U	0.040	0.0087	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,3-Dichlorobenzene	0.030	U	0.060	0.013	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Dichlorodifluoromethane	0.10	U	0.25	0.046	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,1-Dichloroethane	0.030	U	0.040	0.0092	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2-Dichloropropane	0.015	U	0.020	0.0066	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,3-Dichloropropane	0.015	U	0.060	0.0056	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
2,2-Dichloropropane	0.030	U	0.040	0.012	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,1-Dichloropropene	0.015	U	0.040	0.0053	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Isopropylbenzene	0.030	U	0.040	0.0086	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
4-Isopropyltoluene	0.030	U	0.040	0.010	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Methylene Chloride	0.10	U	0.25	0.026	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
4-Methyl-2-pentanone (MIBK)	0.075	U	0.10	0.019	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Methyl tert-butyl ether	0.015	U	0.040	0.0060	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
n-Butylbenzene	0.030	U M	0.040	0.019	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
N-Propylbenzene	0.030	U	0.040	0.015	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
sec-Butylbenzene	0.030	U	0.040	0.0086	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Styrene	0.030	U	0.040	0.013	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
tert-Butylbenzene	0.030	U	0.040	0.0077	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Toluene	0.030	U	0.060	0.014	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
trans-1,2-Dichloroethene	0.030	U	0.060	0.015	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2,3-Trichlorobenzene	0.075	U	0.080	0.040	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2,4-Trichlorobenzene	0.075	U	0.080	0.043	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,1,1-Trichloroethane	0.015	U	0.040	0.0046	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
Trichlorofluoromethane	0.075	U	0.080	0.026	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2,3-Trichloropropane	0.030	U	0.040	0.012	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,2,4-Trimethylbenzene	0.0212	J	0.040	0.014	mg/Kg		12/19/24 14:39	12/19/24 19:27	1
1,3,5-Trimethylbenzene	0.030	U	0.040	0.0076	mg/Kg		12/19/24 14:39	12/19/24 19:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		80 - 120	12/19/24 14:39	12/19/24 19:27	1
Dibromofluoromethane (Surr)	104		80 - 120	12/19/24 14:39	12/19/24 19:27	1
1,2-Dichloroethane-d4 (Surr)	107		80 - 121	12/19/24 14:39	12/19/24 19:27	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 580-480913/11-A

Matrix: Solid

Analysis Batch: 480934

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 480913

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		80 - 120	12/19/24 14:39	12/19/24 19:27	1

Lab Sample ID: LCS 580-480913/7-A

Matrix: Solid

Analysis Batch: 480934

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 480913

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Acetone	4.00	3.73		mg/Kg		93	43 - 150
Bromobenzene	0.800	0.738		mg/Kg		92	78 - 126
2-Butanone (MEK)	4.00	4.61		mg/Kg		115	72 - 134
Carbon disulfide	0.800	0.659		mg/Kg		82	67 - 137
Carbon tetrachloride	0.800	0.873		mg/Kg		109	76 - 140
Chlorobenzene	0.800	0.729		mg/Kg		91	80 - 125
Chlorobromomethane	0.800	0.770		mg/Kg		96	76 - 131
Chloroethane	0.800	0.729		mg/Kg		91	26 - 150
Chloromethane	0.800	0.706		mg/Kg		88	52 - 142
2-Chlorotoluene	0.800	0.773		mg/Kg		97	77 - 134
4-Chlorotoluene	0.800	0.780		mg/Kg		98	71 - 137
cis-1,2-Dichloroethene	0.800	0.781		mg/Kg		98	80 - 125
1,2-Dibromo-3-Chloropropane	0.800	0.790		mg/Kg		99	64 - 129
1,2-Dichlorobenzene	0.800	0.778		mg/Kg		97	78 - 126
1,3-Dichlorobenzene	0.800	0.767		mg/Kg		96	78 - 132
Dichlorodifluoromethane	0.800	0.787		mg/Kg		98	33 - 150
1,1-Dichloroethane	0.800	0.768		mg/Kg		96	78 - 126
1,2-Dichloropropane	0.800	0.803		mg/Kg		100	73 - 130
1,3-Dichloropropane	0.800	0.771		mg/Kg		96	80 - 120
2,2-Dichloropropane	0.800	0.765		mg/Kg		96	75 - 134
1,1-Dichloropropene	0.800	0.769		mg/Kg		96	76 - 140
Ethylbenzene	0.800	0.813		mg/Kg		102	80 - 135
Isopropylbenzene	0.800	0.861		mg/Kg		108	80 - 131
4-Isopropyltoluene	0.800	0.713		mg/Kg		89	71 - 142
Methylene Chloride	0.800	0.750		mg/Kg		94	56 - 140
4-Methyl-2-pentanone (MIBK)	4.00	4.07		mg/Kg		102	68 - 134
Methyl tert-butyl ether	0.800	0.860		mg/Kg		108	71 - 126
m-Xylene & p-Xylene	0.800	0.821		mg/Kg		103	80 - 132
n-Butylbenzene	0.800	0.712		mg/Kg		89	69 - 143
N-Propylbenzene	0.800	0.813		mg/Kg		102	78 - 133
o-Xylene	0.800	0.763		mg/Kg		95	80 - 132
sec-Butylbenzene	0.800	0.740		mg/Kg		93	71 - 143
Styrene	0.800	0.749		mg/Kg		94	79 - 129
tert-Butylbenzene	0.800	0.734		mg/Kg		92	72 - 144
Toluene	0.800	0.724		mg/Kg		90	75 - 125
trans-1,2-Dichloroethene	0.800	0.746		mg/Kg		93	77 - 134
1,2,3-Trichlorobenzene	0.800	0.699		mg/Kg		87	58 - 146
1,2,4-Trichlorobenzene	0.800	0.730		mg/Kg		91	74 - 131
1,1,1-Trichloroethane	0.800	0.827		mg/Kg		103	78 - 135
Trichlorofluoromethane	0.800	0.844		mg/Kg		105	71 - 150
1,2,3-Trichloropropane	0.800	0.760		mg/Kg		95	77 - 127

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-480913/7-A

Matrix: Solid

Analysis Batch: 480934

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 480913

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2,4-Trimethylbenzene	0.800	0.766		mg/Kg		96	73 - 138
1,3,5-Trimethylbenzene	0.800	0.770		mg/Kg		96	72 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	96		80 - 120
Dibromofluoromethane (Surr)	101		80 - 120
1,2-Dichloroethane-d4 (Surr)	102		80 - 121
Toluene-d8 (Surr)	97		80 - 120

Lab Sample ID: LCSD 580-480913/8-A

Matrix: Solid

Analysis Batch: 480934

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 480913

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Acetone	4.00	5.51	Q	mg/Kg		138	43 - 150	39	28
Bromobenzene	0.800	0.723		mg/Kg		90	78 - 126	2	20
2-Butanone (MEK)	4.00	4.70		mg/Kg		118	72 - 134	2	31
Carbon disulfide	0.800	0.643		mg/Kg		80	67 - 137	3	20
Carbon tetrachloride	0.800	0.852		mg/Kg		107	76 - 140	2	20
Chlorobenzene	0.800	0.725		mg/Kg		91	80 - 125	1	20
Chlorobromomethane	0.800	0.754		mg/Kg		94	76 - 131	2	20
Chloroethane	0.800	0.487		mg/Kg		61	26 - 150	40	40
Chloromethane	0.800	0.719		mg/Kg		90	52 - 142	2	40
2-Chlorotoluene	0.800	0.771		mg/Kg		96	77 - 134	0	21
4-Chlorotoluene	0.800	0.774		mg/Kg		97	71 - 137	1	21
cis-1,2-Dichloroethene	0.800	0.766		mg/Kg		96	80 - 125	2	20
1,2-Dibromo-3-Chloropropane	0.800	0.819		mg/Kg		102	64 - 129	4	40
1,2-Dichlorobenzene	0.800	0.785		mg/Kg		98	78 - 126	1	20
1,3-Dichlorobenzene	0.800	0.766		mg/Kg		96	78 - 132	0	20
Dichlorodifluoromethane	0.800	0.759		mg/Kg		95	33 - 150	4	31
1,1-Dichloroethane	0.800	0.755		mg/Kg		94	78 - 126	2	20
1,2-Dichloropropane	0.800	0.805		mg/Kg		101	73 - 130	0	20
1,3-Dichloropropane	0.800	0.747		mg/Kg		93	80 - 120	3	20
2,2-Dichloropropane	0.800	0.750		mg/Kg		94	75 - 134	2	20
1,1-Dichloropropene	0.800	0.765		mg/Kg		96	76 - 140	0	20
Ethylbenzene	0.800	0.796		mg/Kg		99	80 - 135	2	20
Isopropylbenzene	0.800	0.892		mg/Kg		111	80 - 131	3	20
4-Isopropyltoluene	0.800	0.781		mg/Kg		98	71 - 142	9	29
Methylene Chloride	0.800	0.736		mg/Kg		92	56 - 140	2	20
4-Methyl-2-pentanone (MIBK)	4.00	4.07		mg/Kg		102	68 - 134	0	20
Methyl tert-butyl ether	0.800	0.852		mg/Kg		106	71 - 126	1	20
m-Xylene & p-Xylene	0.800	0.819		mg/Kg		102	80 - 132	0	20
n-Butylbenzene	0.800	0.791		mg/Kg		99	69 - 143	10	31
N-Propylbenzene	0.800	0.809		mg/Kg		101	78 - 133	0	24
o-Xylene	0.800	0.763		mg/Kg		95	80 - 132	0	20
sec-Butylbenzene	0.800	0.794		mg/Kg		99	71 - 143	7	29
Styrene	0.800	0.734		mg/Kg		92	79 - 129	2	20
tert-Butylbenzene	0.800	0.764		mg/Kg		96	72 - 144	4	27

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-480913/8-A

Matrix: Solid

Analysis Batch: 480934

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 480913

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Toluene	0.800	0.708		mg/Kg		88	75 - 125	2	20
trans-1,2-Dichloroethene	0.800	0.742		mg/Kg		93	77 - 134	1	20
1,2,3-Trichlorobenzene	0.800	0.926		mg/Kg		116	58 - 146	28	28
1,2,4-Trichlorobenzene	0.800	0.905		mg/Kg		113	74 - 131	21	26
1,1,1-Trichloroethane	0.800	0.761		mg/Kg		95	78 - 135	8	20
Trichlorofluoromethane	0.800	0.772		mg/Kg		96	71 - 150	9	30
1,2,3-Trichloropropane	0.800	0.734		mg/Kg		92	77 - 127	3	20
1,2,4-Trimethylbenzene	0.800	0.785		mg/Kg		98	73 - 138	3	22
1,3,5-Trimethylbenzene	0.800	0.792		mg/Kg		99	72 - 134	3	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		80 - 120
Dibromofluoromethane (Surr)	99		80 - 120
1,2-Dichloroethane-d4 (Surr)	100		80 - 121
Toluene-d8 (Surr)	94		80 - 120

Method: 8260D SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-481242/3-A

Matrix: Solid

Analysis Batch: 481244

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 481242

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0013	U	0.0050	0.00098	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Bromoform	0.00206	J	0.0050	0.0011	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Bromomethane	0.0025	U	0.0050	0.00074	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Chlorodibromomethane	0.00127	J	0.0050	0.00057	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Chloroform	0.0025	U M	0.0050	0.00085	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
cis-1,3-Dichloropropene	0.0025	U	0.0050	0.0013	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Dibromomethane	0.00144	J	0.0050	0.0012	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
1,4-Dichlorobenzene	0.00191	J	0.0050	0.0011	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Dichlorobromomethane	0.00112	J	0.0050	0.00059	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
1,2-Dichloroethane	0.0025	U	0.0050	0.0019	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
1,1-Dichloroethene	0.0013	U	0.0050	0.00062	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Ethylene Dibromide	0.00188	J	0.0050	0.0013	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Hexachlorobutadiene	0.00634	J	0.010	0.0030	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
2-Hexanone	0.025	U	0.036	0.018	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Naphthalene	0.0050	U	0.020	0.0035	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
1,1,1,2-Tetrachloroethane	0.00122	J	0.0050	0.00075	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
1,1,1,2,2-Tetrachloroethane	0.00249	J	0.010	0.0014	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Tetrachloroethene	0.00236	J	0.0050	0.0011	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
trans-1,3-Dichloropropene	0.0025	U	0.0050	0.00094	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
1,1,2-Trichloroethane	0.00226	J	0.0050	0.00046	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Trichloroethene	0.00124	J	0.0050	0.0012	mg/Kg		12/23/24 15:14	12/23/24 21:12	1
Vinyl chloride	0.0050	U	0.020	0.0024	mg/Kg		12/23/24 15:14	12/23/24 21:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105	M	79 - 120	12/23/24 15:14	12/23/24 21:12	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8260D SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-481242/3-A

Matrix: Solid

Analysis Batch: 481244

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 481242

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	106		78 - 120	12/23/24 15:14	12/23/24 21:12	1
1,2-Dichloroethane-d4 (Surr)	104		79 - 121	12/23/24 15:14	12/23/24 21:12	1
Toluene-d8 (Surr)	97		79 - 120	12/23/24 15:14	12/23/24 21:12	1

Lab Sample ID: LCS 580-481242/1-A

Matrix: Solid

Analysis Batch: 481244

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 481242

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	0.200	0.175		mg/Kg		88	80 - 120
Bromoform	0.200	0.200		mg/Kg		100	71 - 143
Bromomethane	0.200	0.248		mg/Kg		124	34 - 150
Chlorodibromomethane	0.200	0.190		mg/Kg		95	76 - 138
Chloroform	0.200	0.167		mg/Kg		83	80 - 122
cis-1,3-Dichloropropene	0.200	0.164		mg/Kg		82	73 - 130
Dibromomethane	0.200	0.177		mg/Kg		89	78 - 128
1,4-Dichlorobenzene	0.200	0.172		mg/Kg		86	78 - 127
Dichlorobromomethane	0.200	0.176		mg/Kg		88	75 - 134
1,2-Dichloroethane	0.200	0.188		mg/Kg		94	75 - 127
1,1-Dichloroethene	0.200	0.159		mg/Kg		80	65 - 129
Ethylene Dibromide	0.200	0.176		mg/Kg		88	77 - 130
Hexachlorobutadiene	0.200	0.195		mg/Kg		98	73 - 135
2-Hexanone	1.00	1.01		mg/Kg		101	64 - 143
Naphthalene	0.200	0.282		mg/Kg		141	41 - 150
1,1,1,2-Tetrachloroethane	0.200	0.177		mg/Kg		88	80 - 127
1,1,2,2-Tetrachloroethane	0.200	0.169		mg/Kg		84	65 - 139
Tetrachloroethene	0.200	0.167		mg/Kg		83	76 - 127
trans-1,3-Dichloropropene	0.200	0.195		mg/Kg		98	66 - 138
1,1,2-Trichloroethane	0.200	0.176		mg/Kg		88	80 - 123
Trichloroethene	0.200	0.169		mg/Kg		85	80 - 127
Vinyl chloride	0.200	0.164		mg/Kg		82	56 - 144

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	106	M	79 - 120
Dibromofluoromethane (Surr)	100		78 - 120
1,2-Dichloroethane-d4 (Surr)	100		79 - 121
Toluene-d8 (Surr)	96		79 - 120

Lab Sample ID: LCSD 580-481242/2-A

Matrix: Solid

Analysis Batch: 481244

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 481242

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	0.200	0.180		mg/Kg		90	80 - 120	3	20
Bromoform	0.200	0.204		mg/Kg		102	71 - 143	2	20
Bromomethane	0.200	0.183		mg/Kg		92	34 - 150	30	35
Chlorodibromomethane	0.200	0.192		mg/Kg		96	76 - 138	1	20
Chloroform	0.200	0.168		mg/Kg		84	80 - 122	1	20

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8260D SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-481242/2-A

Matrix: Solid

Analysis Batch: 481244

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 481242

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
cis-1,3-Dichloropropene	0.200	0.167		mg/Kg		83	73 - 130	2	20
Dibromomethane	0.200	0.181		mg/Kg		90	78 - 128	2	20
1,4-Dichlorobenzene	0.200	0.180		mg/Kg		90	78 - 127	5	20
Dichlorobromomethane	0.200	0.180		mg/Kg		90	75 - 134	2	20
1,2-Dichloroethane	0.200	0.192		mg/Kg		96	75 - 127	2	20
1,1-Dichloroethene	0.200	0.164		mg/Kg		82	65 - 129	3	23
Ethylene Dibromide	0.200	0.178		mg/Kg		89	77 - 130	1	20
Hexachlorobutadiene	0.200	0.204		mg/Kg		102	73 - 135	5	20
2-Hexanone	1.00	1.03		mg/Kg		103	64 - 143	2	20
Naphthalene	0.200	0.286		mg/Kg		143	41 - 150	1	21
1,1,1,2-Tetrachloroethane	0.200	0.180		mg/Kg		90	80 - 127	2	20
1,1,2,2-Tetrachloroethane	0.200	0.177		mg/Kg		89	65 - 139	5	20
Tetrachloroethene	0.200	0.171		mg/Kg		85	76 - 127	3	20
trans-1,3-Dichloropropene	0.200	0.201		mg/Kg		100	66 - 138	3	20
1,1,2-Trichloroethane	0.200	0.179		mg/Kg		90	80 - 123	2	20
Trichloroethene	0.200	0.173		mg/Kg		86	80 - 127	2	20
Vinyl chloride	0.200	0.171		mg/Kg		86	56 - 144	4	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	104	M	79 - 120
Dibromofluoromethane (Surr)	100		78 - 120
1,2-Dichloroethane-d4 (Surr)	101		79 - 121
Toluene-d8 (Surr)	97		79 - 120

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Lab Sample ID: MB 580-481190/5-A

Matrix: Solid

Analysis Batch: 481185

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 481190

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	11	U	12	5.6	mg/Kg		12/23/24 10:23	12/23/24 12:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	57		50 - 150	12/23/24 10:23	12/23/24 12:26	1
4-Bromofluorobenzene (Surr)	100		50 - 150	12/23/24 10:23	12/23/24 12:26	1

Lab Sample ID: LCS 580-481190/3-A

Matrix: Solid

Analysis Batch: 481185

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 481190

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Gasoline Range Organics (GRO)-C6-C10	40.0	37.5		mg/Kg		94	60 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Trifluorotoluene (Surr)	100		50 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS) (Continued)

Lab Sample ID: LCS 580-481190/3-A

Matrix: Solid

Analysis Batch: 481185

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 481190

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene (Surr)	97		50 - 150

Lab Sample ID: LCSD 580-481190/4-A

Matrix: Solid

Analysis Batch: 481185

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 481190

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics (GRO)-C6-C10	40.0	41.9		mg/Kg		105	60 - 120	11	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Trifluorotoluene (Surr)	102		50 - 150
4-Bromofluorobenzene (Surr)	98		50 - 150

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - RA

Lab Sample ID: MB 580-480917/1-A

Matrix: Solid

Analysis Batch: 481470

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 480917

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene - RA	0.0050	U	0.0055	0.0024	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
2-Methylnaphthalene - RA	0.0050	U	0.0060	0.0030	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Acenaphthene - RA	0.0050	U	0.0055	0.0016	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Acenaphthylene - RA	0.0050	U	0.0055	0.0017	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Anthracene - RA	0.0050	U	0.0055	0.0019	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Benzo[a]anthracene - RA	0.0050	U	0.0055	0.0022	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Benzo[a]pyrene - RA	0.0050	U	0.0055	0.0019	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Benzo[b]fluoranthene - RA	0.0030	U	0.0050	0.0012	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Benzo[g,h,i]perylene - RA	0.0050	U	0.0055	0.0018	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Benzo[k]fluoranthene - RA	0.0050	U	0.0055	0.0017	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Chrysene - RA	0.0030	U	0.0050	0.0015	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Dibenz(a,h)anthracene - RA	0.0050	U	0.0055	0.00072	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Fluoranthene - RA	0.0030	U	0.0050	0.0014	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Fluorene - RA	0.0050	U	0.0055	0.0013	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Indeno[1,2,3-cd]pyrene - RA	0.0050	U	0.0055	0.0022	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Naphthalene - RA	0.0040	U	0.0050	0.0016	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Phenanthrene - RA	0.0040	U	0.0050	0.0016	mg/Kg		12/19/24 12:49	12/27/24 14:47	1
Pyrene - RA	0.0050	U	0.0055	0.0010	mg/Kg		12/19/24 12:49	12/27/24 14:47	1

	MB	MB					Prepared	Analyzed	Dil Fac
Surrogate	%Recovery	Qualifier	Limits						
Terphenyl-d14 - RA	80		57 - 145				12/19/24 12:49	12/27/24 14:47	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - RA (Continued)

Lab Sample ID: LCS 580-480917/2-A

Matrix: Solid

Analysis Batch: 481470

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 480917

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene - RA	2.00	1.67		mg/Kg		84	64 - 120
2-Methylnaphthalene - RA	2.00	1.67		mg/Kg		84	64 - 120
Acenaphthene - RA	2.00	1.62		mg/Kg		81	65 - 120
Acenaphthylene - RA	2.00	1.59		mg/Kg		79	66 - 120
Anthracene - RA	2.00	1.71		mg/Kg		85	53 - 132
Benzo[a]anthracene - RA	2.00	1.71		mg/Kg		85	66 - 127
Benzo[a]pyrene - RA	2.00	1.86		mg/Kg		93	66 - 124
Benzo[b]fluoranthene - RA	2.00	1.80		mg/Kg		90	54 - 122
Benzo[g,h,i]perylene - RA	2.00	1.74		mg/Kg		87	61 - 128
Benzo[k]fluoranthene - RA	2.00	1.82		mg/Kg		91	51 - 131
Chrysene - RA	2.00	1.66		mg/Kg		83	57 - 128
Dibenz(a,h)anthracene - RA	2.00	1.72		mg/Kg		86	64 - 133
Fluoranthene - RA	2.00	1.76		mg/Kg		88	64 - 130
Fluorene - RA	2.00	1.66		mg/Kg		83	62 - 126
Indeno[1,2,3-cd]pyrene - RA	2.00	1.81		mg/Kg		90	63 - 132
Naphthalene - RA	2.00	1.62		mg/Kg		81	65 - 120
Phenanthrene - RA	2.00	1.77		mg/Kg		89	63 - 120
Pyrene - RA	2.00	1.78		mg/Kg		89	62 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Terphenyl-d14 - RA	84		57 - 145

Method: 8011 - EDB and DBCP in Water by Microextraction

Lab Sample ID: MB 580-481320/1-A

Matrix: Solid

Analysis Batch: 481622

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 481320

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene Dibromide	0.000040	U M	0.000050	0.000012	mg/Kg		12/26/24 13:19	12/30/24 19:12	1
1,2,3-Trichloropropane	0.00016	U M	0.00030	0.000066	mg/Kg		12/26/24 13:19	12/30/24 19:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dibromopropane	101		60 - 140	12/26/24 13:19	12/30/24 19:12	1

Lab Sample ID: LCS 580-481320/2-A

Matrix: Solid

Analysis Batch: 481622

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 481320

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ethylene Dibromide	0.000400	0.000398		mg/Kg		99	60 - 140
1,2,3-Trichloropropane	0.000400	0.000418		mg/Kg		105	60 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dibromopropane	102		60 - 140

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 8011 - EDB and DBCP in Water by Microextraction (Continued)

Lab Sample ID: LCSD 580-481320/3-A

Matrix: Solid

Analysis Batch: 481622

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 481320

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ethylene Dibromide	0.000400	0.000363		mg/Kg		91	60 - 140	9	20
1,2,3-Trichloropropane	0.000400	0.000434	M	mg/Kg		109	60 - 140	4	20
Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits						
1,2-Dibromopropane	104		60 - 140						

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 580-480945/1-A

Matrix: Solid

Analysis Batch: 481693

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 480945

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.018	U	0.020	0.0074	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
PCB-1221	0.020	U	0.020	0.012	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
PCB-1232	0.018	U	0.020	0.0049	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
PCB-1242	0.018	U	0.020	0.0080	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
PCB-1248	0.018	U	0.020	0.0070	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
PCB-1254	0.020	U	0.020	0.0090	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
PCB-1260	0.018	U	0.020	0.0074	mg/Kg		12/19/24 15:13	12/31/24 20:22	1
Surrogate	MB %Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	92		44 - 135				12/19/24 15:13	12/31/24 20:22	1
Tetrachloro-m-xylene	85		48 - 150				12/19/24 15:13	12/31/24 20:22	1

Lab Sample ID: LCS 580-480945/3-A

Matrix: Solid

Analysis Batch: 481693

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 480945

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016	0.100	0.0903		mg/Kg		90	42 - 150		
PCB-1260	0.100	0.0894		mg/Kg		89	43 - 145		
Surrogate	LCS %Recovery	LCS Qualifier	LCS Limits						
DCB Decachlorobiphenyl	92		44 - 135						
Tetrachloro-m-xylene	92		48 - 150						

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Lab Sample ID: MB 580-480898/1-A

Matrix: Solid

Analysis Batch: 481055

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 480898

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	15	U	20	8.9	mg/Kg		12/19/24 10:45	12/20/24 15:42	1
RRO (nC25-nC36)	30	U	50	19	mg/Kg		12/19/24 10:45	12/20/24 15:42	1

Eurofins Seattle

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) (Continued)

Lab Sample ID: MB 580-480898/1-A
Matrix: Solid
Analysis Batch: 481055

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 480898

	MB	MB								
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac				
o-Terphenyl	92		60 - 120	12/19/24 10:45	12/20/24 15:42	1				
n-Triacontane-d62	74		60 - 120	12/19/24 10:45	12/20/24 15:42	1				

Lab Sample ID: LCS 580-480898/2-A
Matrix: Solid
Analysis Batch: 481055

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 480898

			Spike	LCS	LCS				%Rec	
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	
DRO (nC10-<nC25)			500	443		mg/Kg		89	75 - 125	
RRO (nC25-nC36)			500	456		mg/Kg		91	60 - 120	
Surrogate	LCS	LCS								
%Recovery	Qualifier	Limits								
o-Terphenyl	96		60 - 120							
n-Triacontane-d62	88		60 - 120							

Lab Sample ID: 580-146688-1 MS
Matrix: Solid
Analysis Batch: 481055

Client Sample ID: B-23
Prep Type: Total/NA
Prep Batch: 480898

	Sample	Sample	Spike	MS	MS				%Rec	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
DRO (nC10-<nC25)	1000	J1	470	1660	J1	mg/Kg	✖	134	75 - 125	
RRO (nC25-nC36)	29	U	470	448		mg/Kg	✖	95	60 - 120	
Surrogate	MS	MS								
%Recovery	Qualifier	Limits								
o-Terphenyl	90		50 - 150							
n-Triacontane-d62	94		50 - 150							

Lab Sample ID: 580-146688-1 MSD
Matrix: Solid
Analysis Batch: 481055

Client Sample ID: B-23
Prep Type: Total/NA
Prep Batch: 480898

	Sample	Sample	Spike	MSD	MSD				%Rec	RPD	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
DRO (nC10-<nC25)	1000	J1	476	1590		mg/Kg	✖	118	75 - 125	4	20
RRO (nC25-nC36)	29	U	476	458		mg/Kg	✖	96	60 - 120	2	20
Surrogate	MSD	MSD									
%Recovery	Qualifier	Limits									
o-Terphenyl	91		50 - 150								
n-Triacontane-d62	87		50 - 150								

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 350-4116/23-A
Matrix: Solid
Analysis Batch: 4185

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 4116

	MB	MB								
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac	
Lead	0.10	U	0.25	0.053	mg/Kg		12/26/24 13:42	12/27/24 21:11	5	

Eurofins Seattle

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: LCS 350-4116/24-A				Client Sample ID: Lab Control Sample			
Matrix: Solid				Prep Type: Total/NA			
Analysis Batch: 4185				Prep Batch: 4116			
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	50.0	50.7	D	mg/Kg		101	80 - 120

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Client Sample ID: B-23

Date Collected: 12/12/24 13:01

Date Received: 12/17/24 14:49

Lab Sample ID: 580-146688-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	481062	NH	EET SEA	12/20/24 11:56

Client Sample ID: B-23

Date Collected: 12/12/24 13:01

Date Received: 12/17/24 14:49

Lab Sample ID: 580-146688-1

Matrix: Solid

Percent Solids: 100.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			480913	AA	EET SEA	12/19/24 11:47
Total/NA	Analysis	8260D		1	480934	TL1	EET SEA	12/19/24 20:51
Total/NA	Prep	5035			481242	BYM	EET SEA	12/23/24 15:14
Total/NA	Analysis	8260D SIM		1	481244	K1K	EET SEA	12/23/24 22:15
Total/NA	Prep	5035	DL		481190	BYM	EET SEA	12/23/24 10:23
Total/NA	Analysis	AK101	DL	1	481185	TL1	EET SEA	12/23/24 13:29
Total/NA	Prep	3546			480917	KI	EET SEA	12/19/24 12:49
Total/NA	Analysis	8270E SIM		1	481338	VLF	EET SEA	12/26/24 17:27
Total/NA	Prep	8011			481320	TOA	EET SEA	12/26/24 13:19
Total/NA	Analysis	8011		1	481622	SW	EET SEA	12/30/24 23:09
Total/NA	Prep	3546			480945	KI	EET SEA	12/19/24 15:13
Total/NA	Analysis	8082A		1	481693	T1L	EET SEA	01/01/25 00:47
Total/NA	Prep	3546			480898	KI	EET SEA	12/19/24 10:46
Total/NA	Analysis	AK102 & 103		1	481055	SW	EET SEA	12/20/24 20:44
Total/NA	Prep	3050B			4116	J1H	EET SSM	12/26/24 13:42
Total/NA	Analysis	6020B		10	4185	CW	EET SSM	12/27/24 21:56

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

EET SSM = Eurofins Seattle Specialty Metals, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-004	02-19-25
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids
8260D	5035	Solid	1,1-Dichloropropene
8260D	5035	Solid	1,2-Dibromo-3-Chloropropane
8260D	5035	Solid	1,3-Dichloropropane
8260D	5035	Solid	2,2-Dichloropropane
8260D	5035	Solid	2-Chlorotoluene
8260D	5035	Solid	4-Chlorotoluene
8260D	5035	Solid	4-Isopropyltoluene
8260D	5035	Solid	Chlorobromomethane
ANAB	Dept. of Defense ELAP	L2236	01-19-25
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids

Laboratory: Eurofins Seattle Specialty Metals

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-004	02-19-25
ANAB	Dept. of Defense ELAP	L2236	01-19-25
ANAB	ISO/IEC 17025	L2236	01-19-25
California	State	2954	07-07-25
Florida	NELAP	E87575	06-30-25
Louisiana (All)	NELAP	03073	06-30-25
Maine	State	WA01273	05-02-26
New Jersey	NELAP	WA014	06-30-25
New York	NELAP	11662	04-01-25
Oregon	NELAP	4167-008	07-07-25
US Fish & Wildlife	US Federal Programs	A20571	06-30-25
USDA	US Federal Programs	525-23-4-22573	01-04-26
Washington	State	C788-23a	07-13-25
Wisconsin	State	399133460	07-31-25

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport Water System

Job ID: 580-146688-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-146688-1	B-23	Solid	12/12/24 13:01	12/17/24 14:49

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Page 7 of 7

Laboratory Eurobills

Attn: Track Director

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

www.shannonwilson.com

Turn Around Time:	☒ Normal	☐ Rush	Quote No:
			MSA No:
Please Specify			J-Flags: ☒ Yes ☐ No

Analytical Methods (include preservative if used)

www.shannonwilson.com

Turn Around Time:	☒ Normal	☐ Rush
Please Specify		

Quote No:	
MSA No:	
J-Flags:	☒ Yes ☐ No

Sample Identity	Lab No.	Time	Date Sampled
G20 AK101 (M.O.R)			
VOC G20/PRG (M.O.R)			
DRO/PRG AK102/AK103 (M.O.R)			
PRG-TOTAL LEAD G20/B			
P4H G20/E-PM			
TCCB G20/B			
Total Number of Containers			

Remarks/Matrix Composition/Grab? Sample Containers

Remarks/Matrix Composition/Grab? Sample Containers



580-146688 Chain of Custody

Project Information		Sample Receipt	
Number:	112494-002	Total No. of Containers:	
Name:	Yak Waterline	COC Seals/Intact?	Y/N/NA
Contact:	AMS	Received Good Cond./Cold	
Ongoing Project?	Yes ☐ No ☒	Temp:	
Sampler:	LOW	Delivery Method:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: <u>[Signature]</u> Date: <u>12/16</u> Printed Name: <u>Lucas Wasley</u> Company: <u>Shannon's</u>	Signature: <u>[Signature]</u> Date: <u>12/17/18</u> Printed Name: <u>Ricky Reyes</u> Company: <u>EETN</u>	Signature: _____ Date: _____ Printed Name: _____ Company: _____
Signature: _____ Date: _____ Printed Name: _____ Company: _____	Signature: _____ Date: _____ Printed Name: _____ Company: _____	Signature: _____ Date: _____ Printed Name: _____ Company: _____

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - Shannon & Wilson - job file

Alaska AIR CARGO		
GOLDSTREAK		
Route : FAI - SEA AS0106 16DEC		
SCC : FRA, PER, COL		
Destination :	Total Pieces :	Total Weight(lbs)
SEA	1	26.0
Air Waybill No : 027-70207104		
0277020710400001		
GOLDSTREAK		

Job Number: 112494-006 Date: 12/16/24

Print Name: Lucas Wausley

Signature: *Lucas Wausley*

SHANNON & WILSON

2355 Hill Road
Fairbanks, Alaska 99709
907-479-0600

Cooler ID No. 10f1

TAL Work Order _____

COOLER RECEIPT FORM

Project Yak Waterline

Cooler received on 12/17/24 and opened on 12/17/24 by Ricky Reyes

[Signature]

(signature)

Temperature upon receipt:

Cooler: Corr 3.3 °C, Uncorr 2.9 °C Therm ID: IR14

Temp. Blank: Corr 3.0 °C, Uncorr 0.4 °C Therm ID: 13

1. Were custody seals on outside of cooler and intact?

a. If yes, how many and where: 2

b. Were signature and date correct?

YES NO

2. Were custody papers taped to lid inside cooler?

YES NO

3. Were custody papers properly filled out (ink, signed, etc)?

YES NO

4. Did you sign custody papers in the appropriate place?

YES NO

5. Did you attach shipper's packing slip to this form?

YES NO

6. What kind of packing material was used? Bub bag

7. Was sufficient ice used?

YES NO

8. Were all bottles sealed in separate plastic bags?

YES NO

9. Did all bottles arrive in good condition (unbroken)?

YES NO

10. Were all bottle labels complete (no., date, signed, pres, etc)?

YES NO

11. Did all bottle labels and tags agree with custody papers?

YES NO

12. Were correct bottles used for the test indicated?

YES NO

13. If present, were vial vials checked for absence of airbubbles and noted if found?

N/A YES NO

14. Adequate volume of vial vials received per sample?

N/A YES NO

15. Was sufficient amount of sample sent in each bottle?

YES NO

16. Were correct preservatives used?

YES NO

17. Were extra labels added to pre-tared containers?

YES NO

18. Corrective action taken, if necessary:

a. Name of person contacted:

b. Date:

10/15/10

Self-Service Pick Up



Air Waybill Number **027-70207104** Total pieces **1** Total weight **26.0 lbs** Product **GOLDSTREAK**

Shipper

SHANNON AND WILSON INC
2355 HILL RD
FAIRBANKS, AK-99712

Consignee

EUROFINS ENVIRONMENT TESTING
SAMPLE CONTROL
5755 8TH STREET
SEATTLE, WA-98424

Pieces	Weight	Description	Origin/Destination	Status
1	26.0 lbs	DANGEROUS GOODS IN EXCEPTED QUANTITY DGD AND NOTOC NOT REQUIRE...	FAI - SEA	Ready

The undersigned acknowledges the receipt of above mentioned consignment is complete and in good condition.

Picked up by
Ricky Reyes

Date
12/17/2024

Time
2:49 PM

Picking up from our GoldStreak lockers?
Proceed to the lockers and scan this code.



Book your next shipment at alaskacargo.com.

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 580-146688-1

Login Number: 146688

List Source: Eurofins Seattle

List Number: 1

Creator: Groves, Elizabeth

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 580-146688-1

Login Number: 146688

List Number: 2

Creator: Miller, Darren R

List Source: Eurofins Seattle Specialty Metals

List Creation: 12/19/24 06:50 AM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Ashley Jaramillo	CS Site Name:	ADOT&PF Yakutat Airport Multiple Sites	Lab Name:	Eurofins Seattle
Title:	Senior Chemist	ADEC File No.:	1530.38.018	Lab Report No.:	580-146688-1 (Rev1)
Consulting Firm:	Shannon & Wilson, Inc.	Hazard ID No.:	25640	Lab Report Date:	1/9/2025

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
Yes ☒ No ☐ N/A ☐
Comments: Project samples were sent to Eurofins Seattle (Eurofins) laboratory in Tacoma, Washington. Eurofins is certified for the requested analyses under DEC approval 20-004 issued 2/7/2022 with an expiration of 2/19/2025.
- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
Yes ☐ No ☐ N/A ☒
Comments: Samples were not transferred to another “network” laboratory or sub-contracted to an alternate laboratory.

2. Chain of Custody (CoC)

- a. Is the CoC information completed, signed, and dated (including released/received by)?
Yes ☒ No ☐ N/A ☐
Comments: However, the lab signed the next relinquished by section of the CoC instead of the received by section of the CoC at sample login. Analyses performed as requested. Data quality and/or usability not affected.
- b. Were the correct analyses requested?
Yes ☒ No ☐ N/A ☐
Analyses requested: GRO by AK101, DRO by AK102, RRO by AK103, VOCs by 8260D, total lead by 6020B, PAHs by 8270E-SIM, and PCBs by 8082A.

CS Site Name: ADOT&PF Yakutat Airport Multiple Sites

Lab Report No.: 580-146688-1 (Rev1)

Comments: The lab analyzed VOCs by 8260D in addition to 8011 and 8260D-SIM. These are the correct methods for this project. Data quality and/or usability not affected.

3. Laboratory Sample Receipt Documentation

- a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐

Cooler temperature(s): Cooler temperature was noted at 3.3° C

Sample temperature(s): Not reported.

Comments: Cooler temperature is within acceptable limits.

- b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?

Yes ☒ No ☐ N/A ☐

Comments: None

- c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?

Yes ☒ No ☐ N/A ☐

Comments: Samples were noted to have arrived 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, canister not holding a vacuum, etc.?

Yes ☐ No ☐ N/A ☒

Comments: No discrepancies were noted at sample login.

- e. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: No sample handling discrepancies were noted at sample login.

4. Case Narrative

- a. Is the case narrative present and understandable?

Yes ☒ No ☐ N/A ☐

Comments: None

- b. Are there discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐

Comments:

Revision 1/9/2025

The report was revised to show the correct temperature that the cooler was received. The previous temperature reflected was due to a sample login error. Data quality and/or usability not affected.

GC/MS VOA

Method 8260D: The method blank for preparation batch 580-480913 and analytical batch 580-480934 contained 1,2,4-Trimethylbenzene above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed. See Section 6.a. for details regarding impacts to data quality and/or usability, as applicable.

Method 8260D: The RPD for acetone demonstrated between the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 580-480913 and analytical batch 580-480934 was outside control limits. See Section 6.b. for details regarding impacts to data quality and/or usability, as applicable.

Method 8260D_SIM_AK: The continuing calibration verification (CCV) associated with batch 580-481244 exhibited low recovery for vinyl chloride. A RL standard was analyzed, and the target analytes were detected. Since the associated samples were non-detect for vinyl chloride, the data are reported. Consequently, the vinyl chloride result in sample B-23 is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

Method 8260D_SIM_AK: The CCV associated with batch 580-481244 exhibited elevated recovery for Naphthalene. The samples associated with this CCV were non-detect; therefore, the data have been reported. Consequently, the naphthalene result of sample B-23 is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

Method 8260D_SIM_AK: The method blank for preparation batch 580-481242 and analytical batch 580-481244 contained Bromoform, Chlorodibromomethane, Dibromomethane, 1,4-Dichlorobenzene, Dichlorobromomethane, Ethylene Dibromide, Hexachlorobutadiene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, 1,1,2-Trichloroethane and Trichloroethene above the method detection limit. These target analyte concentrations were less than the RL in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed. See Section 6.a. for details regarding impacts to data quality and/or usability, as applicable.

Method 8270E_SIM: The method blank MB 580-480917/1-A exhibited low recovery for the surrogate 2,4,6-Tribromophenol. The LCS surrogate recovery was within limits and samples, barring sample matrix, were passing for this surrogate. Data quality and/or usability not affected.

Diesel Range Organics

CS Site Name: ADOT&PF Yakutat Airport Multiple Sites

Lab Report No.: 580-146688-1 (Rev1)

Method AK102_103: The matrix spike (MS) recoveries for preparation batch 580-480898 and analytical batch 580-481055 were outside control limits. Non-homogeneity is suspected because the associated LCS recovery was within acceptance limits. See Section 6.c. for details regarding impacts to data quality and/or usability, as applicable.

Method 8011: Sample B-23 formed emulsions during the extraction procedure. The emulsions were broken up using centrifuge. Data quality and/or usability not affected.

Method 8011: The CCV associated with batch 580-481622 exhibited elevated recovery for 1,2,3-Trichloropropane. The samples associated with this CCV were non-detects; therefore, the data have been reported. Data quality and/or usability not affected.

Method 8082A: The CCV associated with batch 580-481693 exhibited elevated recovery for PCB-1221 on one column. Results are confirmed on both columns and reported from the passing column. Data quality and/or usability not affected.

- c. Were all the corrective actions documented?

Yes ☒ No ☐ N/A ☐

Comments: Where needed.

- d. What is the effect on data quality/usability according to the case narrative?

Comments: Effect on data quality and/or usability due to discrepancies, errors, or QC failures identified by the lab in the case narrative are either discussed above in Section 4.b. or elsewhere in this checklist.

5. Sample Results

- a. Are the correct analyses performed/reported as requested on CoC?

Yes ☒ No ☐ N/A ☐

Comments: The lab analyzed VOCs by 8260D in addition to 8011 and 8260D-SIM. These are the correct methods for this project. Data quality and/or usability not affected.

- b. Are all applicable holding times met?

Yes ☒ No ☐ N/A ☐

Comments: None

- c. Are all soils reported on a dry weight basis?

Yes ☒ No ☐ N/A ☐

Comments: None

- d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?

Yes ☒ No ☐ N/A ☐

Comments: Analytical sensitivity was evaluated to verify that LODs met applicable DEC's most stringent values between the DEC cleanup levels in 18 AAC 75.341 Table B1 and B2 Method Two (Migration to Groundwater or Over 40 Inch Zone Human Health) for non-detect results, as appropriate. Analytes with LODs that do not meet applicable cleanup levels are bolded in the analytical results table. Data quality and/or usability may be affected as these analytes cannot be detected, if present, at their respective cleanup level.

- e. Is the data quality or usability affected?

Yes ☒ No ☐ N/A ☐

Comments: See 5.d., above.

6. QC Samples

a. Method Blank

- i. Was one method blank reported per matrix, analysis, and 20 samples?

Yes ☒ No ☐ N/A ☐

Comments:

- ii. Are all method blank results less than LOQ (or RL)?

Yes ☒ No ☐

Comments: However, the following analytes were detected in their respective method blank samples below the RL: VOC analyte 1,2,4-Trimethylbenzene and VOC-SIM analytes 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,4-Dichlorobenzene, Bromoform, Chlorodibromomethane, Dichlorobromomethane, Hexachlorobutadiene, 1,1,2-Trichloroethane, Dibromomethane, Tetrachloroethene, Trichloroethene, and Ethylene Dibromide.

- 1,2,4-Trimethylbenzene was not detected in associated sample B-23 analyzed with the method blank sample for batch 580-480913. Data quality and/or usability not affected.
- 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,4-Dichlorobenzene, Bromoform, Chlorodibromomethane, Dichlorobromomethane, Hexachlorobutadiene, and 1,1,2-Trichloroethane were not detected in associated sample B-23 analyzed with the method blank sample for batch 580-481242. Data quality and/or usability not affected.
- Dibromomethane, Tetrachloroethene, and Trichloroethene were detected below the LOQ and within ten times the concentration detected in the method blank sample for batch 580-481242 in associated sample B-23. Consequently, the results of these

analytes in the noted sample are considered not detected due to method blank contamination and are reported at the LOQ and are flagged 'B*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with the applied flags.

- Ethylene dibromide was detected above the LOQ and within ten times the concentration detected in the method blank sample for batch 580-481242 in associated sample B-23. Consequently, the result of this analyte in the noted sample is considered an estimate, biased high, and is flagged 'JH*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with the applied flags.

- iii. If above LoQ or RL, what samples are affected?

Comments: See 6.a.ii., above.

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☒ No ☐ N/A ☐

Comments: See 6.a.ii., above.

- v. Data quality or usability affected?

Yes ☒ No ☐ N/A ☐

Comments: See 6.a.ii., above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics – Are 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: LCS samples were reported for DRO, RRO, PAH, and PCBs.

LCS/LCSD samples were reported for GRO, VOC, and VOC-SIM analyses.

- ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: An LCS was reported for lead analysis.

- iii. Accuracy – Are 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: None

- iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the 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 VOC LCS/LCSD RPD for acetone was outside laboratory limits for batch 580-480913. Acetone was not detected in the associated project sample B-23; therefore, the result of this analyte in the noted sample is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected, however, data is considered usable with applied flags.

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: %Rs were within acceptable limits. See 6.b.iv. for RPDs outside of acceptable limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☒ No ☐ N/A ☐

Comments: See 6.b.iv.

- vii. Is the data quality or usability affected?

Yes ☒ No ☐ N/A ☐

Comments: See 6.b.iv.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: MS/MSD samples were reported for DRO and RRO analyses.

- ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: None

- iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☐ No ☒ N/A ☐

Comments: The MS recovery for DRO in parent sample B-23 was above laboratory limits. The DRO concentration in the parent sample was much

larger than the spike concentration added. The spike therefore could not be quantified against the background concentration. Data quality and/or usability not affected.

- iv. Precision – Are 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: None

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: See 6.b.iii for %Rs outside of acceptable limits. RPDs were within acceptable limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☒ N/A ☐

Comments: See 6.b.iii.

- vii. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: See 6.b.iii

- 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: None

- ii. Accuracy – Are 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: None

- 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 samples had failed surrogate recoveries.

- iv. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: No samples had failed surrogate recoveries.

e. Trip Blanks

- i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples?

Yes ☐ No ☒ N/A ☐

Comments: A trip blank was erroneously not included in the cooler with volatile samples. We cannot access transportation cross-contamination.

- ii. Are all results less than LoQ or RL?

Yes ☐ No ☐ N/A ☒

Comments: A trip blank was inadvertently not included in the cooler with volatile samples.

- iii. If above LoQ or RL, what samples are affected?

Comments: Not applicable. A trip blank was not included in the cooler with volatile samples.

- iv. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: A trip blank was not included in the cooler with volatile samples.

f. Field Duplicate

- i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?

Yes ☐ No ☒ N/A ☐

Comments: Field duplicates were erroneously not collected for this project.

- ii. Was the duplicate submitted blind to lab?

Yes ☐ No ☐ N/A ☒

Comments: Field duplicates were not collected for this project.

- iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes ☐ No ☐ N/A ☒

CS Site Name: ADOT&PF Yakutat Airport Multiple Sites

Lab Report No.: 580-146688-1 (Rev1)

Comments: Field duplicates were not collected for this project.

iv. Is the data quality or usability affected? (Explain)

Yes ☐ No ☒ N/A ☐

Comments: Field duplicates were not collected for this project.

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?

Yes ☐ No ☐ N/A ☒

Comments: Samples were not collected using reusable equipment.

ii. Are all results less than LoQ or RL?

Yes ☐ No ☐ N/A ☒

Comments: Samples were not collected using reusable equipment.

iii. If above LoQ or RL, specify what samples are affected.

Comments: Not applicable, samples were not collected using reusable equipment.

iv. Are data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: Samples were not collected using reusable equipment.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?

Yes ☐ No ☐ N/A ☒

Comments: No other data flags/qualifiers were required.

Appendix E

Eurofins – South Bend Laboratory Report and LDRC

CONTENTS

- Eurofins – South Bend Laboratory Report 810-131289-1
- DEC Laboratory Data Review Checklist for WO 810-131289-1

ANALYTICAL REPORT

PREPARED FOR

Attn: Ashley Jaramillo
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Generated 12/26/2024 9:39:51 PM

JOB DESCRIPTION

112494-002 Yakutat Airport

JOB NUMBER

810-131289-1

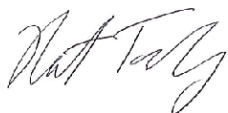
Eurofins Eaton Analytical South Bend

Job Notes

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Biology

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Shannon & Wilson, Inc
Project: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Job ID: 810-131289-1

Eurofins Eaton Analytical South Bend

Job Narrative 810-131289-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 12/12/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.8°C.

Receipt Exceptions

The following sample(s) was received outside of holding time: <Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis.>

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

Method 150.1: The following sample(s) was received outside of holding time: <Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis.>

Method 353.2: The following sample(s) was received outside of holding time: <Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis.>

Method Nitrate_Calc: The following sample(s) was received outside of holding time: <Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis.>

Method SM2330B: The Langlier Index result for B-1 (810-131289-1) was calculated using Lab pH and Default Temperature of 20 Degrees Celsius.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Biology

Method 9223B_CIPA18_DW: The following sample(s) was received outside of holding time: <Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis.>

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Eaton Analytical South Bend

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1

Lab Sample ID: 810-131289-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	3.5		2.0	mg/L	1		300.0	Total/NA
Sulfate	7.1		5.0	mg/L	1		300.0	Total/NA
Sodium	3.4		0.10	mg/L	1		200.7	Total Recoverable
Potassium	2.6		0.20	mg/L	1		200.7	Total Recoverable
Magnesium	4.3		0.10	mg/L	1		200.7	Total Recoverable
Iron	1.1		0.010	mg/L	1		200.7	Total Recoverable
Calcium	57		0.10	mg/L	1		200.7	Total Recoverable
Iron, Dissolved	0.012		0.010	mg/L	1		200.7	Dissolved
Aluminum	960		20	ug/L	1		200.8	Total Recoverable
Arsenic	1.7		1.0	ug/L	1		200.8	Total Recoverable
Barium	32		2.0	ug/L	1		200.8	Total Recoverable
Chromium	3.2		0.90	ug/L	1		200.8	Total Recoverable
Zinc	6.0		5.0	ug/L	1		200.8	Total Recoverable
Copper	5.5		2.0	ug/L	1		200.8	Total Recoverable
Manganese	130		2.0	ug/L	1		200.8	Total Recoverable
Manganese, Dissolved	120		2.0	ug/L	1		200.8	Dissolved
Calcium hardness as CaCO3	140		0.25	mg/L	1		SM 2340B	Total/NA
pH	7.6	HF	0.1	SU	1		150.1	Total/NA
Nitrite as N	0.011		0.010	mg/L	1		353.2	Total/NA
Total Alkalinity as CaCO3	140		1.0	mg/L	1		SM 2320B	Total/NA
Langelier Index	0.12			LangSU	1		SM 2330B	Total/NA
Total Dissolved Solids	190		10	mg/L	1		SM 2540C	Total/NA

Client Sample ID: B-1 LTB (10-28-2024)

Lab Sample ID: 810-131289-2

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Eaton Analytical South Bend

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1

Lab Sample ID: 810-131289-1

Date Collected: 12/10/24 10:40

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Method: EPA-DW 524.2 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,1,1-Trichloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,1,2-Trichloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,1-Dichloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,1-Dichloroethene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,1-Dichloropropene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2,3-Trichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2,3-Trichloropropane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2,4-Trichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2,4-Trimethylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2-Dibromo-3-Chloropropane	<0.20		0.20	ug/L			12/13/24 08:34	1
1,2-Dibromoethane (EDB)	<0.20		0.20	ug/L			12/13/24 08:34	1
1,2-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2-Dichloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,2-Dichloropropane	<0.25		0.25	ug/L			12/13/24 08:34	1
o-Xylene	<0.50		0.50	ug/L			12/13/24 08:34	1
m-Xylene & p-Xylene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,3,5-Trimethylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,3-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
1,3-Dichloropropane	<0.50		0.50	ug/L			12/13/24 08:34	1
1,4-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
2,2-Dichloropropane	<0.50		0.50	ug/L			12/13/24 08:34	1
2-Chlorotoluene	<0.50		0.50	ug/L			12/13/24 08:34	1
4-Chlorotoluene	<0.50		0.50	ug/L			12/13/24 08:34	1
Benzene	<0.50		0.50	ug/L			12/13/24 08:34	1
4-Isopropyltoluene	<0.50		0.50	ug/L			12/13/24 08:34	1
Bromobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
Bromochloromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Bromodichloromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Bromoform	<0.50		0.50	ug/L			12/13/24 08:34	1
Bromomethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Carbon tetrachloride	<0.50		0.50	ug/L			12/13/24 08:34	1
Chloroethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Chlorobenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
Chloromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Chloroform	<0.50		0.50	ug/L			12/13/24 08:34	1
Dibromomethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Dichlorodifluoromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Dichloromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Dibromochloromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Ethylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
Hexachlorobutadiene	<0.25		0.25	ug/L			12/13/24 08:34	1
Isopropylbenzene	<0.25		0.25	ug/L			12/13/24 08:34	1
Naphthalene	<0.50		0.50	ug/L			12/13/24 08:34	1
Methyl-tert-butyl Ether (MTBE)	<0.50		0.50	ug/L			12/13/24 08:34	1
Styrene	<0.50		0.50	ug/L			12/13/24 08:34	1
Tetrachloroethene	<0.50		0.50	ug/L			12/13/24 08:34	1
Toluene	<0.50		0.50	ug/L			12/13/24 08:34	1

Eurofins Eaton Analytical South Bend

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1

Lab Sample ID: 810-131289-1

Date Collected: 12/10/24 10:40

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Method: EPA-DW 524.2 - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethylene	<0.50		0.50	ug/L			12/13/24 08:34	1
Trichlorofluoromethane	<0.50		0.50	ug/L			12/13/24 08:34	1
Vinyl chloride	<0.20		0.20	ug/L			12/13/24 08:34	1
tert-Butylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L			12/13/24 08:34	1
cis-1,3-Dichloropropylene	<0.50		0.50	ug/L			12/13/24 08:34	1
n-Butylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
N-Propylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
sec-Butylbenzene	<0.50		0.50	ug/L			12/13/24 08:34	1
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L			12/13/24 08:34	1
trans-1,3-Dichloropropylene	<0.50		0.50	ug/L			12/13/24 08:34	1
Xylenes, Total	<0.50		0.50	ug/L			12/13/24 08:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		70 - 130		12/13/24 08:34	1
Toluene-d8 (Surr)	97		70 - 130		12/13/24 08:34	1
4-Bromofluorobenzene (Surr)	85		70 - 130		12/13/24 08:34	1
1,2-Dichlorobenzene-d4 (Surr)	78		70 - 130		12/13/24 08:34	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.5		2.0	mg/L			12/14/24 20:46	1
Sulfate	7.1		5.0	mg/L			12/14/24 20:46	1

Method: EPA 200.7 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	3.4		0.10	mg/L		12/18/24 12:01	12/19/24 17:57	1
Potassium	2.6		0.20	mg/L		12/18/24 12:01	12/19/24 17:57	1
Magnesium	4.3		0.10	mg/L		12/18/24 12:01	12/19/24 17:57	1
Iron	1.1		0.010	mg/L		12/18/24 12:01	12/19/24 17:57	1
Calcium	57		0.10	mg/L		12/18/24 12:01	12/19/24 17:57	1

Method: EPA 200.7 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	0.012		0.010	mg/L			12/16/24 17:52	1

Method: EPA 200.8 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	960		20	ug/L		12/18/24 12:01	12/19/24 10:21	1
Antimony	<1.0		1.0	ug/L		12/18/24 12:01	12/19/24 10:21	1
Arsenic	1.7		1.0	ug/L		12/18/24 12:01	12/19/24 10:21	1
Barium	32		2.0	ug/L		12/18/24 12:01	12/19/24 10:21	1
Beryllium	<0.30		0.30	ug/L		12/18/24 12:01	12/19/24 10:21	1
Cadmium	<0.50		0.50	ug/L		12/18/24 12:01	12/19/24 10:21	1
Chromium	3.2		0.90	ug/L		12/18/24 12:01	12/19/24 10:21	1
Nickel	<5.0		5.0	ug/L		12/18/24 12:01	12/19/24 10:21	1
Selenium	<2.0		2.0	ug/L		12/18/24 12:01	12/19/24 10:21	1
Silver	<0.50		0.50	ug/L		12/18/24 12:01	12/19/24 12:43	1
Thallium	<0.30		0.30	ug/L		12/18/24 12:01	12/19/24 10:21	1
Zinc	6.0		5.0	ug/L		12/18/24 12:01	12/19/24 10:21	1
Copper	5.5		2.0	ug/L		12/18/24 12:01	12/19/24 10:21	1

Eurofins Eaton Analytical South Bend

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1

Lab Sample ID: 810-131289-1

Date Collected: 12/10/24 10:40

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Method: EPA 200.8 - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	130		2.0	ug/L		12/18/24 12:01	12/19/24 10:21	1

Method: EPA 200.8 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese, Dissolved	120		2.0	ug/L			12/16/24 13:07	1

Method: EPA 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	ug/L		12/18/24 12:47	12/18/24 23:00	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium hardness as CaCO3	140		0.25	mg/L			12/26/24 21:28	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (EPA 150.1)	7.6	HF	0.1	SU			12/12/24 15:26	1
Cyanide, Total (EPA 335.4)	<0.0050		0.0050	mg/L		12/13/24 09:50	12/13/24 10:39	1
Nitrite as N (EPA 353.2)	0.011		0.010	mg/L			12/12/24 13:00	1
Nitrate Nitrite as N (EPA 353.2)	<0.10		0.10	mg/L			12/12/24 13:45	1
Nitrate as N (SM Nitrate by calc)	<0.10		0.10	mg/L			12/12/24 22:20	1
Color, True (SM 2120B)	<3.0		3.0	Color Units			12/12/24 13:46	1
Total Alkalinity as CaCO3 (SM 2320B)	140		1.0	mg/L			12/13/24 15:18	1
Langelier Index (SM 2330B)	0.12			LangSU			12/20/24 14:37	1
Total Dissolved Solids (SM 2540C)	190		10	mg/L			12/12/24 15:00	1
Fluoride (SM 4500 F C)	<0.050		0.050	mg/L			12/13/24 11:30	1

Method: SM 9223B - Coliforms, Total, and E.Coli (Colilert - Presence/Absence)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Escherichia coli	ABSENT	H H3		NONE			12/12/24 13:34	1
Coliform, Total	ABSENT	H H3		NONE			12/12/24 13:34	1

Client Sample ID: B-1 LTB (10-28-2024)

Lab Sample ID: 810-131289-2

Date Collected: 12/10/24 00:00

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Method: EPA-DW 524.2 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,1,1-Trichloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,1,2-Trichloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,1-Dichloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,1-Dichloroethene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,1-Dichloropropene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2,3-Trichlorobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2,3-Trichloropropane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2,4-Trichlorobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2,4-Trimethylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2-Dibromo-3-Chloropropane	<0.20		0.20	ug/L			12/13/24 09:23	1

Eurofins Eaton Analytical South Bend

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1 LTB (10-28-2024)

Lab Sample ID: 810-131289-2

Date Collected: 12/10/24 00:00

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Method: EPA-DW 524.2 - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	<0.20		0.20	ug/L			12/13/24 09:23	1
1,2-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2-Dichloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,2-Dichloropropane	<0.25		0.25	ug/L			12/13/24 09:23	1
o-Xylene	<0.50		0.50	ug/L			12/13/24 09:23	1
m-Xylene & p-Xylene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,3,5-Trimethylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,3-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
1,3-Dichloropropane	<0.50		0.50	ug/L			12/13/24 09:23	1
1,4-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
2,2-Dichloropropane	<0.50		0.50	ug/L			12/13/24 09:23	1
2-Chlorotoluene	<0.50		0.50	ug/L			12/13/24 09:23	1
4-Chlorotoluene	<0.50		0.50	ug/L			12/13/24 09:23	1
Benzene	<0.50		0.50	ug/L			12/13/24 09:23	1
4-Isopropyltoluene	<0.50		0.50	ug/L			12/13/24 09:23	1
Bromobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
Bromochloromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Bromodichloromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Bromoform	<0.50		0.50	ug/L			12/13/24 09:23	1
Bromomethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Carbon tetrachloride	<0.50		0.50	ug/L			12/13/24 09:23	1
Chloroethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Chlorobenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
Chloromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Chloroform	<0.50		0.50	ug/L			12/13/24 09:23	1
Dibromomethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Dichlorodifluoromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Dichloromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Dibromochloromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Ethylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
Hexachlorobutadiene	<0.25		0.25	ug/L			12/13/24 09:23	1
Isopropylbenzene	<0.25		0.25	ug/L			12/13/24 09:23	1
Naphthalene	<0.50		0.50	ug/L			12/13/24 09:23	1
Methyl-tert-butyl Ether (MTBE)	<0.50		0.50	ug/L			12/13/24 09:23	1
Styrene	<0.50		0.50	ug/L			12/13/24 09:23	1
Tetrachloroethene	<0.50		0.50	ug/L			12/13/24 09:23	1
Toluene	<0.50		0.50	ug/L			12/13/24 09:23	1
Trichloroethylene	<0.50		0.50	ug/L			12/13/24 09:23	1
Trichlorofluoromethane	<0.50		0.50	ug/L			12/13/24 09:23	1
Vinyl chloride	<0.20		0.20	ug/L			12/13/24 09:23	1
tert-Butylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L			12/13/24 09:23	1
cis-1,3-Dichloropropylene	<0.50		0.50	ug/L			12/13/24 09:23	1
n-Butylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
N-Propylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
sec-Butylbenzene	<0.50		0.50	ug/L			12/13/24 09:23	1
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L			12/13/24 09:23	1
trans-1,3-Dichloropropylene	<0.50		0.50	ug/L			12/13/24 09:23	1
Xylenes, Total	<0.50		0.50	ug/L			12/13/24 09:23	1

Eurofins Eaton Analytical South Bend

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1 LTB (10-28-2024)

Lab Sample ID: 810-131289-2

Date Collected: 12/10/24 00:00

Matrix: Drinking Water

Date Received: 12/12/24 09:30

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
1,2-Dichloroethane-d4 (Surr)	104		70 - 130		12/13/24 09:23	1
Toluene-d8 (Surr)	98		70 - 130		12/13/24 09:23	1
4-Bromofluorobenzene (Surr)	98		70 - 130		12/13/24 09:23	1
1,2-Dichlorobenzene-d4 (Surr)	77		70 - 130		12/13/24 09:23	1

Surrogate Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 524.2 - Volatile Organic Compounds (GC/MS)

Matrix: Drinking Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	DCA	TOL	BFB	DCZ
		(70-130)	(70-130)	(70-130)	(70-130)
810-131289-1	B-1	107	97	85	78
810-131289-1 DU	B-1	108	99	87	81
810-131289-2	B-1 LTB (10-28-2024)	104	98	98	77
MB 810-126447/5	Method Blank	103	99	88	80
Surrogate Legend					
DCA = 1,2-Dichloroethane-d4 (Surr)					
TOL = Toluene-d8 (Surr)					
BFB = 4-Bromofluorobenzene (Surr)					
DCZ = 1,2-Dichlorobenzene-d4 (Surr)					

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 524.2 - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 810-126447/5

Matrix: Drinking Water

Analysis Batch: 126447

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,1,1-Trichloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,1,2-Trichloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,1-Dichloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,1-Dichloroethene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,1-Dichloropropene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2,3-Trichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2,3-Trichloropropane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2,4-Trichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2,4-Trimethylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2-Dibromo-3-Chloropropane	<0.20		0.20	ug/L			12/13/24 08:09	1
1,2-Dibromoethane (EDB)	<0.20		0.20	ug/L			12/13/24 08:09	1
1,2-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2-Dichloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,2-Dichloropropane	<0.25		0.25	ug/L			12/13/24 08:09	1
o-Xylene	<0.50		0.50	ug/L			12/13/24 08:09	1
m-Xylene & p-Xylene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,3,5-Trimethylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,3-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
1,3-Dichloropropane	<0.50		0.50	ug/L			12/13/24 08:09	1
1,4-Dichlorobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
2,2-Dichloropropane	<0.50		0.50	ug/L			12/13/24 08:09	1
2-Chlorotoluene	<0.50		0.50	ug/L			12/13/24 08:09	1
4-Chlorotoluene	<0.50		0.50	ug/L			12/13/24 08:09	1
Benzene	<0.50		0.50	ug/L			12/13/24 08:09	1
4-Isopropyltoluene	<0.50		0.50	ug/L			12/13/24 08:09	1
Bromobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
Bromochloromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Bromodichloromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Bromoform	<0.50		0.50	ug/L			12/13/24 08:09	1
Bromomethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Carbon tetrachloride	<0.50		0.50	ug/L			12/13/24 08:09	1
Chloroethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Chlorobenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
Chloromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Chloroform	<0.50		0.50	ug/L			12/13/24 08:09	1
Dibromomethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Dichlorodifluoromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Dichloromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Dibromochloromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Ethylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
Hexachlorobutadiene	<0.25		0.25	ug/L			12/13/24 08:09	1
Isopropylbenzene	<0.25		0.25	ug/L			12/13/24 08:09	1
Naphthalene	<0.50		0.50	ug/L			12/13/24 08:09	1
Methyl-tert-butyl Ether (MTBE)	<0.50		0.50	ug/L			12/13/24 08:09	1
Styrene	<0.50		0.50	ug/L			12/13/24 08:09	1
Tetrachloroethene	<0.50		0.50	ug/L			12/13/24 08:09	1

Eurofins Eaton Analytical South Bend

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 524.2 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 810-126447/5

Matrix: Drinking Water

Analysis Batch: 126447

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	<0.50		0.50	ug/L			12/13/24 08:09	1
Trichloroethylene	<0.50		0.50	ug/L			12/13/24 08:09	1
Trichlorofluoromethane	<0.50		0.50	ug/L			12/13/24 08:09	1
Vinyl chloride	<0.20		0.20	ug/L			12/13/24 08:09	1
tert-Butylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L			12/13/24 08:09	1
cis-1,3-Dichloropropylene	<0.50		0.50	ug/L			12/13/24 08:09	1
n-Butylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
N-Propylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
sec-Butylbenzene	<0.50		0.50	ug/L			12/13/24 08:09	1
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L			12/13/24 08:09	1
trans-1,3-Dichloropropylene	<0.50		0.50	ug/L			12/13/24 08:09	1
Xylenes, Total	<0.50		0.50	ug/L			12/13/24 08:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		70 - 130		12/13/24 08:09	1
Toluene-d8 (Surr)	99		70 - 130		12/13/24 08:09	1
4-Bromofluorobenzene (Surr)	88		70 - 130		12/13/24 08:09	1
1,2-Dichlorobenzene-d4 (Surr)	80		70 - 130		12/13/24 08:09	1

Lab Sample ID: 810-131289-1 DU

Matrix: Drinking Water

Analysis Batch: 126447

Client Sample ID: B-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	<0.50		<0.50		ug/L		NC	20
1,1,1-Trichloroethane	<0.50		<0.50		ug/L		NC	20
1,1,2,2-Tetrachloroethane	<0.50		<0.50		ug/L		NC	20
1,1,2-Trichloroethane	<0.50		<0.50		ug/L		NC	20
1,1-Dichloroethane	<0.50		<0.50		ug/L		NC	20
1,1-Dichloroethene	<0.50		<0.50		ug/L		NC	20
1,1-Dichloropropene	<0.50		<0.50		ug/L		NC	20
1,2,3-Trichlorobenzene	<0.50		<0.50		ug/L		NC	20
1,2,3-Trichloropropane	<0.50		<0.50		ug/L		NC	20
1,2,4-Trichlorobenzene	<0.50		<0.50		ug/L		NC	20
1,2,4-Trimethylbenzene	<0.50		<0.50		ug/L		NC	20
1,2-Dibromo-3-Chloropropane	<0.20		<0.20		ug/L		NC	20
1,2-Dibromoethane (EDB)	<0.20		<0.20		ug/L		NC	20
1,2-Dichlorobenzene	<0.50		<0.50		ug/L		NC	20
1,2-Dichloroethane	<0.50		<0.50		ug/L		NC	20
1,2-Dichloropropane	<0.25		<0.25		ug/L		NC	20
o-Xylene	<0.50		<0.50		ug/L		NC	20
m-Xylene & p-Xylene	<0.50		<0.50		ug/L		NC	20
1,3,5-Trimethylbenzene	<0.50		<0.50		ug/L		NC	20
1,3-Dichlorobenzene	<0.50		<0.50		ug/L		NC	20
1,3-Dichloropropane	<0.50		<0.50		ug/L		NC	20
1,4-Dichlorobenzene	<0.50		<0.50		ug/L		NC	20
2,2-Dichloropropane	<0.50		<0.50		ug/L		NC	20

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 524.2 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 810-131289-1 DU

Matrix: Drinking Water

Analysis Batch: 126447

Client Sample ID: B-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
2-Chlorotoluene	<0.50		<0.50		ug/L		NC	20
4-Chlorotoluene	<0.50		<0.50		ug/L		NC	20
Benzene	<0.50		<0.50		ug/L		NC	20
4-Isopropyltoluene	<0.50		<0.50		ug/L		NC	20
Bromobenzene	<0.50		<0.50		ug/L		NC	20
Bromochloromethane	<0.50		<0.50		ug/L		NC	20
Bromodichloromethane	<0.50		<0.50		ug/L		NC	20
Bromoform	<0.50		<0.50		ug/L		NC	20
Bromomethane	<0.50		<0.50		ug/L		NC	20
Carbon tetrachloride	<0.50		<0.50		ug/L		NC	20
Chloroethane	<0.50		<0.50		ug/L		NC	20
Chlorobenzene	<0.50		<0.50		ug/L		NC	20
Chloromethane	<0.50		<0.50		ug/L		NC	20
Chloroform	<0.50		<0.50		ug/L		NC	20
Dibromomethane	<0.50		<0.50		ug/L		NC	20
Dichlorodifluoromethane	<0.50		<0.50		ug/L		NC	20
Dichloromethane	<0.50		<0.50		ug/L		NC	20
Dibromochloromethane	<0.50		<0.50		ug/L		NC	20
Ethylbenzene	<0.50		<0.50		ug/L		NC	20
Hexachlorobutadiene	<0.25		<0.25		ug/L		NC	20
Isopropylbenzene	<0.25		<0.25		ug/L		NC	20
Naphthalene	<0.50		<0.50		ug/L		NC	20
Methyl-tert-butyl Ether (MTBE)	<0.50		<0.50		ug/L		NC	20
Styrene	<0.50		<0.50		ug/L		NC	20
Tetrachloroethene	<0.50		<0.50		ug/L		NC	20
Toluene	<0.50		<0.50		ug/L		NC	20
Trichloroethylene	<0.50		<0.50		ug/L		NC	20
Trichlorofluoromethane	<0.50		<0.50		ug/L		NC	20
Vinyl chloride	<0.20		<0.20		ug/L		NC	20
tert-Butylbenzene	<0.50		<0.50		ug/L		NC	20
cis-1,2-Dichloroethylene	<0.50		<0.50		ug/L		NC	20
cis-1,3-Dichloropropylene	<0.50		<0.50		ug/L		NC	20
n-Butylbenzene	<0.50		<0.50		ug/L		NC	20
N-Propylbenzene	<0.50		<0.50		ug/L		NC	20
sec-Butylbenzene	<0.50		<0.50		ug/L		NC	20
trans-1,2-Dichloroethylene	<0.50		<0.50		ug/L		NC	20
trans-1,3-Dichloropropylene	<0.50		<0.50		ug/L		NC	20
Xylenes, Total	<0.50		<0.50		ug/L		NC	20

Surrogate	%Recovery	DU Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	108		70 - 130
Toluene-d8 (Surr)	99		70 - 130
4-Bromofluorobenzene (Surr)	87		70 - 130
1,2-Dichlorobenzene-d4 (Surr)	81		70 - 130

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 810-126572/4

Matrix: Drinking Water

Analysis Batch: 126572

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0	mg/L			12/14/24 13:36	1
Sulfate	<5.0		5.0	mg/L			12/14/24 13:36	1

Lab Sample ID: LCS 810-126572/5

Matrix: Drinking Water

Analysis Batch: 126572

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.44		mg/L		94	90 - 110
Sulfate	25.0	24.4		mg/L		98	90 - 110

Lab Sample ID: LLCS 810-126572/3

Matrix: Drinking Water

Analysis Batch: 126572

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	2.00	1.58	J	mg/L		79	50 - 150
Sulfate	5.00	4.82	J	mg/L		96	50 - 150

Method: 200.7 - Metals (ICP)

Lab Sample ID: MBL 810-127140/1-A

Matrix: Drinking Water

Analysis Batch: 127354

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 127140

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	<0.035		0.10	mg/L		12/18/24 12:01	12/19/24 17:30	1
Potassium	<0.032		0.20	mg/L		12/18/24 12:01	12/19/24 17:30	1
Magnesium	<0.037		0.10	mg/L		12/18/24 12:01	12/19/24 17:30	1
Iron	<0.0095		0.010	mg/L		12/18/24 12:01	12/19/24 17:30	1
Calcium	<0.034		0.10	mg/L		12/18/24 12:01	12/19/24 17:30	1

Lab Sample ID: LCS 810-127140/4-A

Matrix: Drinking Water

Analysis Batch: 127354

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 127140

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sodium	5.00	4.93		mg/L		99	85 - 115
Potassium	5.00	4.92		mg/L		98	85 - 115
Magnesium	5.00	4.96		mg/L		99	85 - 115
Iron	5.00	4.93		mg/L		99	85 - 115
Calcium	5.00	4.91		mg/L		98	85 - 115

Lab Sample ID: LLCS 810-127140/2-A

Matrix: Drinking Water

Analysis Batch: 127354

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 127140

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Sodium	0.0100	<0.035		mg/L		90	50 - 150
Potassium	0.0100	<0.032		mg/L		102	50 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 200.7 - Metals (ICP) (Continued)

Lab Sample ID: LLCS 810-127140/2-A

Matrix: Drinking Water

Analysis Batch: 127354

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 127140

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Magnesium	0.0100	<0.037		mg/L		97	50 - 150
Iron	0.0100	0.0106		mg/L		106	50 - 150

Lab Sample ID: LLCS 810-127140/3-A

Matrix: Drinking Water

Analysis Batch: 127354

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 127140

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Sodium	0.100	0.0954	J	mg/L		95	50 - 150
Potassium	0.100	0.0980	J	mg/L		98	50 - 150
Magnesium	0.100	0.0954	J	mg/L		95	50 - 150
Calcium	0.100	0.0924	J	mg/L		92	50 - 150

Lab Sample ID: MBL 810-126511/22-A

Matrix: Drinking Water

Analysis Batch: 126686

Client Sample ID: Method Blank

Prep Type: Dissolved

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	<0.0095		0.010	mg/L			12/16/24 17:48	1

Lab Sample ID: LCS 810-126511/23-A

Matrix: Drinking Water

Analysis Batch: 126686

Client Sample ID: Lab Control Sample

Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron, Dissolved	5.00	4.94		mg/L		99	85 - 115

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: LLCS 810-126651/11

Matrix: Drinking Water

Analysis Batch: 126651

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese, Dissolved	0.300	<0.63		ug/L		109	50 - 150

Lab Sample ID: LLCS 810-126651/12

Matrix: Drinking Water

Analysis Batch: 126651

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese, Dissolved	1.00	1.02	J	ug/L		102	50 - 150

Lab Sample ID: MBL 810-127141/1-A

Matrix: Drinking Water

Analysis Batch: 127252

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 127141

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<1.7		20	ug/L		12/18/24 12:01	12/19/24 09:36	1
Antimony	<0.079		1.0	ug/L		12/18/24 12:01	12/19/24 09:36	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: MBL 810-127141/1-A

Matrix: Drinking Water

Analysis Batch: 127252

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 127141

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.59		1.0	ug/L		12/18/24 12:01	12/19/24 09:36	1
Barium	<0.21		2.0	ug/L		12/18/24 12:01	12/19/24 09:36	1
Beryllium	<0.075		0.30	ug/L		12/18/24 12:01	12/19/24 09:36	1
Cadmium	<0.16		0.50	ug/L		12/18/24 12:01	12/19/24 09:36	1
Chromium	<0.29		0.90	ug/L		12/18/24 12:01	12/19/24 09:36	1
Nickel	<0.77		5.0	ug/L		12/18/24 12:01	12/19/24 09:36	1
Selenium	<1.4		2.0	ug/L		12/18/24 12:01	12/19/24 09:36	1
Silver	<0.34		0.50	ug/L		12/18/24 12:01	12/19/24 09:36	1
Thallium	<0.053		0.30	ug/L		12/18/24 12:01	12/19/24 09:36	1
Zinc	<2.3		5.0	ug/L		12/18/24 12:01	12/19/24 09:36	1
Copper	<0.33		2.0	ug/L		12/18/24 12:01	12/19/24 09:36	1
Manganese	<0.63		2.0	ug/L		12/18/24 12:01	12/19/24 09:36	1

Lab Sample ID: MBL 810-127141/1-A

Matrix: Drinking Water

Analysis Batch: 127278

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 127141

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.34		0.50	ug/L		12/18/24 12:01	12/19/24 12:20	1

Lab Sample ID: LCS 810-127141/6-A

Matrix: Drinking Water

Analysis Batch: 127252

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 127141

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	50.0	50.6		ug/L		101	85 - 115
Antimony	50.0	50.5		ug/L		101	85 - 115
Arsenic	50.0	49.2		ug/L		98	85 - 115
Barium	50.0	49.0		ug/L		98	85 - 115
Beryllium	50.0	50.0		ug/L		100	85 - 115
Cadmium	50.0	49.6		ug/L		99	85 - 115
Chromium	50.0	50.4		ug/L		101	85 - 115
Nickel	50.0	49.5		ug/L		99	85 - 115
Selenium	50.0	48.9		ug/L		98	85 - 115
Silver	50.0	48.3		ug/L		97	85 - 115
Thallium	50.0	49.2		ug/L		98	85 - 115
Zinc	50.0	49.5		ug/L		99	85 - 115
Copper	50.0	49.2		ug/L		98	85 - 115
Manganese	50.0	50.6		ug/L		101	85 - 115

Lab Sample ID: LCS 810-127141/6-A

Matrix: Drinking Water

Analysis Batch: 127278

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 127141

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Silver	50.0	46.3		ug/L		93	85 - 115

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LLCS 810-127141/2-A
Matrix: Drinking Water
Analysis Batch: 127252

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127141

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.300	0.331	J	ug/L		110	50 - 150
Arsenic	0.300	<0.59		ug/L		107	50 - 150
Barium	0.300	0.297	J	ug/L		99	50 - 150
Beryllium	0.300	0.332		ug/L		111	50 - 150
Cadmium	0.300	0.261	J	ug/L		87	50 - 150
Chromium	0.300	0.299	J	ug/L		100	50 - 150
Selenium	0.300	<1.4		ug/L		104	50 - 150
Thallium	0.300	0.305		ug/L		102	50 - 150
Zinc	0.300	<2.3		ug/L		144	50 - 150
Copper	0.300	<0.33		ug/L		64	50 - 150
Manganese	0.300	<0.63		ug/L		108	50 - 150

Lab Sample ID: LLCS 810-127141/2-A
Matrix: Drinking Water
Analysis Batch: 127278

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127141

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Silver	0.300	<0.34		ug/L		91	50 - 150

Lab Sample ID: LLCS 810-127141/3-A
Matrix: Drinking Water
Analysis Batch: 127252

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127141

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	1.00	1.00		ug/L		100	50 - 150
Arsenic	1.00	1.10		ug/L		110	50 - 150
Barium	1.00	1.01	J	ug/L		101	50 - 150
Nickel	1.00	<0.77		ug/L		62	50 - 150
Selenium	1.00	<1.4		ug/L		114	50 - 150
Zinc	1.00	<2.3		ug/L		115	50 - 150
Copper	1.00	0.895	J	ug/L		90	50 - 150
Manganese	1.00	1.03	J	ug/L		103	50 - 150

Lab Sample ID: LLCS 810-127141/4-A
Matrix: Drinking Water
Analysis Batch: 127252

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127141

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	2.00	2.66	J	ug/L		133	50 - 150
Barium	2.00	2.01		ug/L		101	50 - 150
Nickel	2.00	1.60	J	ug/L		80	50 - 150
Selenium	2.00	2.03		ug/L		102	50 - 150
Zinc	2.00	<2.3		ug/L		113	50 - 150
Copper	2.00	1.89	J	ug/L		95	50 - 150
Manganese	2.00	2.02		ug/L		101	50 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LLCS 810-127141/5-A
Matrix: Drinking Water
Analysis Batch: 127252

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 127141

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	5.00	5.94	J	ug/L		119	50 - 150
Nickel	5.00	4.52	J	ug/L		90	50 - 150
Zinc	5.00	5.57		ug/L		111	50 - 150

Lab Sample ID: MBL 810-126511/1-A
Matrix: Drinking Water
Analysis Batch: 126651

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese, Dissolved	<0.63		2.0	ug/L			12/16/24 12:18	1

Lab Sample ID: LCS 810-126511/2-A
Matrix: Drinking Water
Analysis Batch: 126651

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese, Dissolved	50.0	50.0		ug/L		100	85 - 115

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 810-127080/1-A
Matrix: Drinking Water
Analysis Batch: 127169

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 127080

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	ug/L		12/18/24 12:47	12/18/24 22:48	1

Lab Sample ID: LCS 810-127080/3-A
Matrix: Drinking Water
Analysis Batch: 127169

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 127080

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.943		ug/L		94	85 - 115

Method: 150.1 - pH (Electrometric)

Lab Sample ID: LCSSRM 810-126353/4
Matrix: Drinking Water
Analysis Batch: 126353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec Limits
pH	9.00	9.0		SU		100.4	98.9 - 101.1

Lab Sample ID: LCSSRM 810-126353/7
Matrix: Drinking Water
Analysis Batch: 126353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec Limits
pH	9.00	9.1		SU		100.8	98.9 - 101.1

Eurofins Eaton Analytical South Bend

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 335.4 - Cyanide, Total

Lab Sample ID: MBL 810-126457/5-A
Matrix: Drinking Water
Analysis Batch: 126484

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 126457

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0016		0.0050	mg/L		12/13/24 08:48	12/13/24 10:23	1

Lab Sample ID: LCS 810-126457/2-A
Matrix: Drinking Water
Analysis Batch: 126484

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126457

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.100	0.0990		mg/L		99	90 - 110

Lab Sample ID: LLCS 810-126457/3-A
Matrix: Drinking Water
Analysis Batch: 126484

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 126457

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.00500	0.00540		mg/L		108	50 - 150

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MBL 810-126345/20
Matrix: Drinking Water
Analysis Batch: 126345

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.041		0.10	mg/L			12/12/24 13:44	1

Lab Sample ID: LCS 810-126345/16
Matrix: Drinking Water
Analysis Batch: 126345

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	4.00	4.00		mg/L		100	90 - 110

Lab Sample ID: LLCS 810-126345/19
Matrix: Drinking Water
Analysis Batch: 126345

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	0.100	0.0964	J	mg/L		96	50 - 150

Lab Sample ID: 810-131289-1 MS
Matrix: Drinking Water
Analysis Batch: 126345

Client Sample ID: B-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	<0.10		4.00	4.09		mg/L		100	90 - 110

Eurofins Eaton Analytical South Bend

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: 810-131289-1 MSD
Matrix: Drinking Water
Analysis Batch: 126345

Client Sample ID: B-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate Nitrite as N	<0.10		4.00	4.18		mg/L		103	90 - 110	2	10

Lab Sample ID: MBL 810-126346/15
Matrix: Drinking Water
Analysis Batch: 126346

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	<0.0069		0.010	mg/L			12/12/24 12:57	1

Lab Sample ID: LCS 810-126346/13
Matrix: Drinking Water
Analysis Batch: 126346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrite as N	0.200	0.202		mg/L		101	90 - 110

Lab Sample ID: LLCS 810-126346/14
Matrix: Drinking Water
Analysis Batch: 126346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrite as N	0.0100	0.00930	J	mg/L		93	50 - 150

Lab Sample ID: 810-131289-1 MS
Matrix: Drinking Water
Analysis Batch: 126346

Client Sample ID: B-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrite as N	0.011		0.200	0.216		mg/L		102	90 - 110

Lab Sample ID: 810-131289-1 MSD
Matrix: Drinking Water
Analysis Batch: 126346

Client Sample ID: B-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrite as N	0.011		0.200	0.218		mg/L		103	90 - 110	1	10

Method: SM 2320B - Alkalinity

Lab Sample ID: MBL 810-126553/6
Matrix: Drinking Water
Analysis Batch: 126553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.0		1.0	mg/L			12/13/24 14:33	1

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 810-126553/4

Matrix: Drinking Water

Analysis Batch: 126553

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO ₃	100	91.6		mg/L		92	78 - 114

Lab Sample ID: LLCS 810-126553/5

Matrix: Drinking Water

Analysis Batch: 126553

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO ₃	1.00	1.08		mg/L		108	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MBL 810-126347/1

Matrix: Drinking Water

Analysis Batch: 126347

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10	mg/L			12/12/24 14:40	1

Lab Sample ID: LCS 810-126347/2

Matrix: Drinking Water

Analysis Batch: 126347

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1010		mg/L		101	85 - 115

Method: SM 4500 F C - Fluoride

Lab Sample ID: MBL 810-126505/7

Matrix: Drinking Water

Analysis Batch: 126505

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MBL Result	MBL Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.020		0.050	mg/L			12/13/24 10:48	1

Lab Sample ID: LCS 810-126505/5

Matrix: Drinking Water

Analysis Batch: 126505

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	2.00	2.02		mg/L		101	90 - 110

Lab Sample ID: LLCS 810-126505/6

Matrix: Drinking Water

Analysis Batch: 126505

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	0.0500	0.0600		mg/L		120	50 - 150

Eurofins Eaton Analytical South Bend

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

GC/MS VOA

Analysis Batch: 126447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	524.2	
810-131289-2	B-1 LTB (10-28-2024)	Total/NA	Drinking Water	524.2	
MB 810-126447/5	Method Blank	Total/NA	Drinking Water	524.2	
810-131289-1 DU	B-1	Total/NA	Drinking Water	524.2	

HPLC/IC

Analysis Batch: 126572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	300.0	
MB 810-126572/4	Method Blank	Total/NA	Drinking Water	300.0	
LCS 810-126572/5	Lab Control Sample	Total/NA	Drinking Water	300.0	
LLCS 810-126572/3	Lab Control Sample	Total/NA	Drinking Water	300.0	

Metals

Filtration Batch: 126511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Dissolved	Drinking Water	Filtration	
MBL 810-126511/1-A	Method Blank	Dissolved	Drinking Water	Filtration	
MBL 810-126511/22-A	Method Blank	Dissolved	Drinking Water	Filtration	
LCS 810-126511/23-A	Lab Control Sample	Dissolved	Drinking Water	Filtration	
LCS 810-126511/2-A	Lab Control Sample	Dissolved	Drinking Water	Filtration	

Analysis Batch: 126651

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Dissolved	Drinking Water	200.8	126511
MBL 810-126511/1-A	Method Blank	Dissolved	Drinking Water	200.8	126511
LCS 810-126511/2-A	Lab Control Sample	Dissolved	Drinking Water	200.8	126511
LLCS 810-126651/11	Lab Control Sample	Total/NA	Drinking Water	200.8	
LLCS 810-126651/12	Lab Control Sample	Total/NA	Drinking Water	200.8	

Analysis Batch: 126686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Dissolved	Drinking Water	200.7	126511
MBL 810-126511/22-A	Method Blank	Dissolved	Drinking Water	200.7	126511
LCS 810-126511/23-A	Lab Control Sample	Dissolved	Drinking Water	200.7	126511

Analysis Batch: 126841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 2340B	

Prep Batch: 127080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	245.1	
MB 810-127080/1-A	Method Blank	Total/NA	Drinking Water	245.1	
LCS 810-127080/3-A	Lab Control Sample	Total/NA	Drinking Water	245.1	

Prep Batch: 127140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total Recoverable	Drinking Water	200.2	
MBL 810-127140/1-A	Method Blank	Total Recoverable	Drinking Water	200.2	

Eurofins Eaton Analytical South Bend

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Metals (Continued)

Prep Batch: 127140 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 810-127140/4-A	Lab Control Sample	Total Recoverable	Drinking Water	200.2	
LLCS 810-127140/2-A	Lab Control Sample	Total Recoverable	Drinking Water	200.2	
LLCS 810-127140/3-A	Lab Control Sample	Total Recoverable	Drinking Water	200.2	

Prep Batch: 127141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total Recoverable	Drinking Water	200.8	
MBL 810-127141/1-A	Method Blank	Total Recoverable	Drinking Water	200.8	
LCS 810-127141/6-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	
LLCS 810-127141/2-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	
LLCS 810-127141/3-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	
LLCS 810-127141/4-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	
LLCS 810-127141/5-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	

Analysis Batch: 127169

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	245.1	127080
MB 810-127080/1-A	Method Blank	Total/NA	Drinking Water	245.1	127080
LCS 810-127080/3-A	Lab Control Sample	Total/NA	Drinking Water	245.1	127080

Analysis Batch: 127252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total Recoverable	Drinking Water	200.8	127141
MBL 810-127141/1-A	Method Blank	Total Recoverable	Drinking Water	200.8	127141
LCS 810-127141/6-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141
LLCS 810-127141/2-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141
LLCS 810-127141/3-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141
LLCS 810-127141/4-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141
LLCS 810-127141/5-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141

Analysis Batch: 127278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total Recoverable	Drinking Water	200.8	127141
MBL 810-127141/1-A	Method Blank	Total Recoverable	Drinking Water	200.8	127141
LCS 810-127141/6-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141
LLCS 810-127141/2-A	Lab Control Sample	Total Recoverable	Drinking Water	200.8	127141

Analysis Batch: 127354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total Recoverable	Drinking Water	200.7	127140
MBL 810-127140/1-A	Method Blank	Total Recoverable	Drinking Water	200.7	127140
LCS 810-127140/4-A	Lab Control Sample	Total Recoverable	Drinking Water	200.7	127140
LLCS 810-127140/2-A	Lab Control Sample	Total Recoverable	Drinking Water	200.7	127140
LLCS 810-127140/3-A	Lab Control Sample	Total Recoverable	Drinking Water	200.7	127140

General Chemistry

Analysis Batch: 126340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 2120B	
LCSSRM 810-126340/11	Lab Control Sample	Total/NA	Drinking Water	SM 2120B	

Eurofins Eaton Analytical South Bend

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

General Chemistry

Analysis Batch: 126345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	353.2	
MBL 810-126345/20	Method Blank	Total/NA	Drinking Water	353.2	
LCS 810-126345/16	Lab Control Sample	Total/NA	Drinking Water	353.2	
LLCS 810-126345/19	Lab Control Sample	Total/NA	Drinking Water	353.2	
810-131289-1 MS	B-1	Total/NA	Drinking Water	353.2	
810-131289-1 MSD	B-1	Total/NA	Drinking Water	353.2	

Analysis Batch: 126346

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	353.2	
MBL 810-126346/15	Method Blank	Total/NA	Drinking Water	353.2	
LCS 810-126346/13	Lab Control Sample	Total/NA	Drinking Water	353.2	
LLCS 810-126346/14	Lab Control Sample	Total/NA	Drinking Water	353.2	
810-131289-1 MS	B-1	Total/NA	Drinking Water	353.2	
810-131289-1 MSD	B-1	Total/NA	Drinking Water	353.2	

Analysis Batch: 126347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 2540C	
MBL 810-126347/1	Method Blank	Total/NA	Drinking Water	SM 2540C	
LCS 810-126347/2	Lab Control Sample	Total/NA	Drinking Water	SM 2540C	

Analysis Batch: 126353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	150.1	
LCSSRM 810-126353/4	Lab Control Sample	Total/NA	Drinking Water	150.1	
LCSSRM 810-126353/7	Lab Control Sample	Total/NA	Drinking Water	150.1	

Analysis Batch: 126398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	Nitrate by calc	

Prep Batch: 126457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	Distill/CN	
MBL 810-126457/5-A	Method Blank	Total/NA	Drinking Water	Distill/CN	
LCS 810-126457/2-A	Lab Control Sample	Total/NA	Drinking Water	Distill/CN	
LLCS 810-126457/3-A	Lab Control Sample	Total/NA	Drinking Water	Distill/CN	

Analysis Batch: 126484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	335.4	126457
MBL 810-126457/5-A	Method Blank	Total/NA	Drinking Water	335.4	126457
LCS 810-126457/2-A	Lab Control Sample	Total/NA	Drinking Water	335.4	126457
LLCS 810-126457/3-A	Lab Control Sample	Total/NA	Drinking Water	335.4	126457

Analysis Batch: 126505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 4500 F C	
MBL 810-126505/7	Method Blank	Total/NA	Drinking Water	SM 4500 F C	
LCS 810-126505/5	Lab Control Sample	Total/NA	Drinking Water	SM 4500 F C	

Eurofins Eaton Analytical South Bend

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

General Chemistry (Continued)

Analysis Batch: 126505 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LLCS 810-126505/6	Lab Control Sample	Total/NA	Drinking Water	SM 4500 F C	

Analysis Batch: 126553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 2320B	
MBL 810-126553/6	Method Blank	Total/NA	Drinking Water	SM 2320B	
LCS 810-126553/4	Lab Control Sample	Total/NA	Drinking Water	SM 2320B	
LLCS 810-126553/5	Lab Control Sample	Total/NA	Drinking Water	SM 2320B	

Analysis Batch: 127559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 2330B	

Biology

Analysis Batch: 126339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
810-131289-1	B-1	Total/NA	Drinking Water	SM 9223B	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Client Sample ID: B-1

Lab Sample ID: 810-131289-1

Date Collected: 12/10/24 10:40

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	524.2		1	126447	AC	EA SB	12/13/24 08:34
Total/NA	Analysis	300.0		1	126572	NR	EA SB	12/14/24 20:46
Dissolved	Filtration	Filtration			126511	CA	EA SB	12/13/24 14:31
Dissolved	Analysis	200.7		1	126686	AC	EA SB	12/16/24 17:52
Total Recoverable	Prep	200.2			127140	NB	EA SB	12/18/24 12:01
Total Recoverable	Analysis	200.7		1	127354	AC	EA SB	12/19/24 17:57
Dissolved	Filtration	Filtration			126511	CA	EA SB	12/13/24 14:31
Dissolved	Analysis	200.8		1	126651	CA	EA SB	12/16/24 13:07
Total Recoverable	Prep	200.8			127141	NB	EA SB	12/18/24 12:01
Total Recoverable	Analysis	200.8		1	127252	CA	EA SB	12/19/24 10:21
Total Recoverable	Prep	200.8			127141	NB	EA SB	12/18/24 12:01
Total Recoverable	Analysis	200.8		1	127278	CA	EA SB	12/19/24 12:43
Total/NA	Prep	245.1			127080	AC	EA SB	12/18/24 12:47
Total/NA	Analysis	245.1		1	127169	AC	EA SB	12/18/24 23:00
Total/NA	Analysis	SM 2340B		1	126841	AC	EA SB	12/26/24 21:28
Total/NA	Analysis	150.1		1	126353	KH	EA SB	12/12/24 15:26
Total/NA	Prep	Distill/CN			126457	KH	EA SB	12/13/24 09:50
Total/NA	Analysis	335.4		1	126484	KH	EA SB	12/13/24 10:39
Total/NA	Analysis	353.2		1	126346	KH	EA SB	12/12/24 13:00
Total/NA	Analysis	353.2		1	126345	KH	EA SB	12/12/24 13:45
Total/NA	Analysis	Nitrate by calc		1	126398	JT	EA SB	12/12/24 22:20
Total/NA	Analysis	SM 2120B		1	126340	GB	EA SB	12/12/24 13:46
Total/NA	Analysis	SM 2320B		1	126553	KH	EA SB	12/13/24 15:18
Total/NA	Analysis	SM 2330B		1	127559	KH	EA SB	12/20/24 14:37
Total/NA	Analysis	SM 2540C		1	126347	KH	EA SB	12/12/24 15:00
Total/NA	Analysis	SM 4500 F C		1	126505	KH	EA SB	12/13/24 11:30
Total/NA	Analysis	SM 9223B		1	126339	RR	EA SB	12/12/24 13:34 - 12/13/24 10:15 ¹

Client Sample ID: B-1 LTB (10-28-2024)

Lab Sample ID: 810-131289-2

Date Collected: 12/10/24 00:00

Matrix: Drinking Water

Date Received: 12/12/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	524.2		1	126447	AC	EA SB	12/13/24 09:23

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EA SB = Eurofins Eaton Analytical South Bend, 110 S Hill Street, South Bend, IN 46617, TEL (574)233-4777

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Laboratory: Eurofins Eaton Analytical South Bend

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Alaska	State	IN00035	06-30-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
524.2		Drinking Water	1,1,1,2-Tetrachloroethane
524.2		Drinking Water	1,1,2,2-Tetrachloroethane
524.2		Drinking Water	1,1-Dichloroethane
524.2		Drinking Water	1,1-Dichloropropene
524.2		Drinking Water	1,2,3-Trichlorobenzene
524.2		Drinking Water	1,2,3-Trichloropropane
524.2		Drinking Water	1,2,4-Trimethylbenzene
524.2		Drinking Water	1,2-Dibromo-3-Chloropropane
524.2		Drinking Water	1,2-Dibromoethane (EDB)
524.2		Drinking Water	1,3,5-Trimethylbenzene
524.2		Drinking Water	1,3-Dichlorobenzene
524.2		Drinking Water	1,3-Dichloropropane
524.2		Drinking Water	2,2-Dichloropropane
524.2		Drinking Water	2-Chlorotoluene
524.2		Drinking Water	4-Chlorotoluene
524.2		Drinking Water	4-Isopropyltoluene
524.2		Drinking Water	Bromobenzene
524.2		Drinking Water	Bromochloromethane
524.2		Drinking Water	Bromomethane
524.2		Drinking Water	Chloroethane
524.2		Drinking Water	Chloromethane
524.2		Drinking Water	cis-1,3-Dichloropropylene
524.2		Drinking Water	Dibromomethane
524.2		Drinking Water	Dichlorodifluoromethane
524.2		Drinking Water	Hexachlorobutadiene
524.2		Drinking Water	Isopropylbenzene
524.2		Drinking Water	Methyl-tert-butyl Ether (MTBE)
524.2		Drinking Water	m-Xylene & p-Xylene
524.2		Drinking Water	Naphthalene
524.2		Drinking Water	n-Butylbenzene
524.2		Drinking Water	N-Propylbenzene
524.2		Drinking Water	o-Xylene
524.2		Drinking Water	sec-Butylbenzene
524.2		Drinking Water	tert-Butylbenzene
524.2		Drinking Water	trans-1,3-Dichloropropylene
524.2		Drinking Water	Trichlorofluoromethane
SM 2330B		Drinking Water	Langelier Index
SM 2340B		Drinking Water	Calcium hardness as CaCO3
SM 9223B		Drinking Water	Coliform, Total
SM 9223B		Drinking Water	Escherichia coli

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Method	Method Description	Protocol	Laboratory
524.2	Volatile Organic Compounds (GC/MS)	EPA-DW	EA SB
300.0	Anions, Ion Chromatography	EPA	EA SB
200.7	Metals (ICP)	EPA	EA SB
200.8	Metals (ICP/MS)	EPA	EA SB
245.1	Mercury (CVAA)	EPA	EA SB
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EA SB
150.1	pH (Electrometric)	EPA	EA SB
335.4	Cyanide, Total	EPA	EA SB
353.2	Nitrogen, Nitrate-Nitrite	EPA	EA SB
Nitrate by calc	Nitrogen, Nitrate-Nitrite	SM	EA SB
SM 2120B	Color, True, Colorimetric	SM	EA SB
SM 2320B	Alkalinity	SM	EA SB
SM 2330B	Corrosivity, LSI Calculation	SM	EA SB
SM 2540C	Solids, Total Dissolved (TDS)	SM	EA SB
SM 4500 F C	Fluoride	SM	EA SB
SM 9223B	Coliforms, Total, and E.Coli (Colilert - Presence/Absence)	SM	EA SB
200.2	Preparation, Total Recoverable Metals	EPA	EA SB
200.8	Preparation, Total Recoverable Metals	EPA	EA SB
245.1	Preparation, Mercury	EPA	EA SB
Distill/CN	Distillation, Cyanide	None	EA SB
Filtration	Sample Filtration	None	EA SB

Protocol References:

EPA = US Environmental Protection Agency

EPA-DW = "Methods For The Determination Of Organic Compounds In Drinking Water", EPA/600/4-88/039, December 1988 And Its Supplements.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EA SB = Eurofins Eaton Analytical South Bend, 110 S Hill Street, South Bend, IN 46617, TEL (574)233-4777

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: 112494-002 Yakutat Airport

Job ID: 810-131289-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
810-131289-1	B-1	Drinking Water	12/10/24 10:40	12/12/24 09:30
810-131289-2	B-1 LTB (10-28-2024)	Drinking Water	12/10/24 00:00	12/12/24 09:30

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urofins Eaton Analytical South Bend
10 S Hill Street
South Bend, IN 46617
Phone (574) 233-4777 Phone (574) 233-4777



810-131289 COC

Client Information

Client Contact: Ashley Jaramillo
Company: Shannon & Wilson, Inc
Address: 2355 Hill Rd.
City: Fairbanks
State, Zip: AK 99709-5244
Phone: 907-251-7534
Email: ashley.jaramillo@shannonil.com
Project Name: 112494-002 Yakutat Airport
Site:

Due Date Requested: 810-131289 COC

TAT Requested (days): Standard

Compliance Project: ☐ Yes ☒ No

Purchase Order not required

PO #:

W/O #:

Project #:

SSOW#:

Sampler: Lucas Worsley

Phone:

PWSID: NA

Lab PM: Trowbridge, Nathan

E-Mail: Nathan.Trowbridge@eurofins.com

Carrier Tracking No(s):

State of Origin: Alaska

Analysis Requested

Field Filtered Sample (Yes or No)	
Perform AS-100	☒
524.2_Pres_PREC - Phase I, II & V Regulated & Unregulated V	☒
2540C_Calcd - Total Dissolved Solids (TDS)	☒
9223B_CIPA18_DW - Local Method	☒
200.7_SDWA, 200.8_SDWA, 245.1_SDWA	☒
2120B_True - True Color	☒
200.7_SDWA, 200.8_SDWA	☒
335.4 - Total Cyanide	☒
150.1, 353.2	☒
4500_F_C - Fluoride	☒
2320B - Total Alkalinity Only / Corrosivity	☒
300_OF_28D_PREC - Chloride, Sulfate	☒

Total Number of containers

Preservation Codes:

HA - Asb&Cd&HCL
N - None
R - NaOH/SO4
D - HNO3
PX - NaOH/NaBH4

Other:

Special Instructions/Note:

Initial Temp: 1.6
Corrected Temp: 1.0
IR Gun # 7500

Laber comment
as result not good
kill 11.10.2024
hold test required
- Jan 12-2024

Sample Identification

B-1 (10181 24)
B-2 (10181 24)

12/10/24 1040

Sample Date

Sample Time

Sample Type

Matrix

Preservation Code

Drinking Water

G

HA

N

R

D

N

N

N

Possible Hazard Identification

☐ Non-Hazard

☐ Flammable

☐ Skin Irritant

☐ Poison B

☐ Unknown

☐ Radiological

Date:

Time:

Method of Shipment:

Received by:

Date/Time:

Company:

Received by:

Date/Time:

Company:

Deliverable Requested: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Deliverable Requested by:

Date/Time:

Company:

Deliverable Requested by:

Date/Time:

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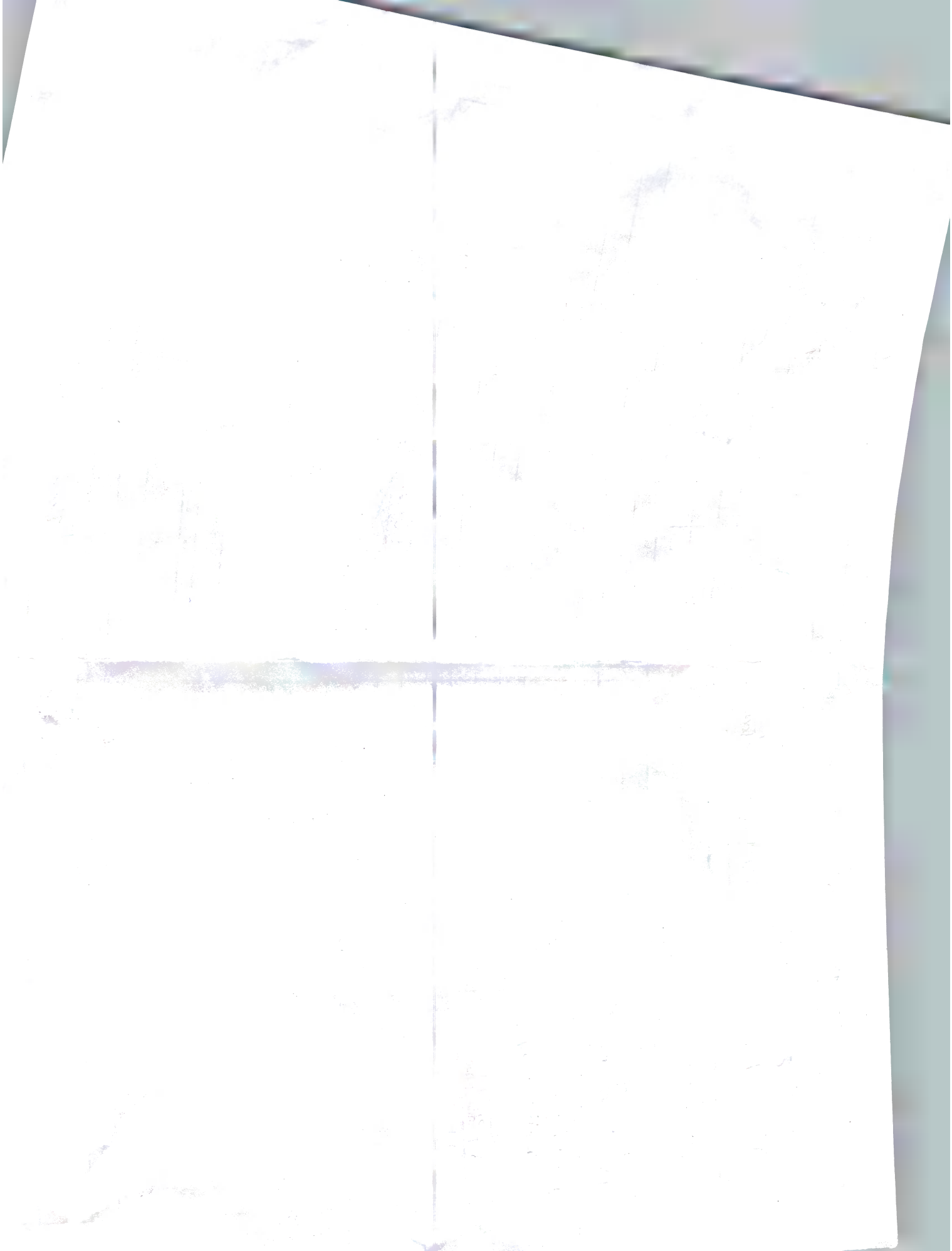
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Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 810-131289-1

Login Number: 131289

List Source: Eurofins Eaton Analytical South Bend

List Number: 1

Creator: Moore, Gary

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Samples do not require splitting or compositing.	True	
Container provided by EEA	True	

ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Ashley Jaramillo	CS Site Name:	NA	Lab Name:	Eurofins Eaton Analytical, LLC
Title:	Senior Chemist	ADEC File No.:	NA	Lab Report No.:	810-131289-1
Consulting Firm:	Shannon & Wilson, Inc.	Hazard ID No.:	NA	Lab Report Date:	12/26/24

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?

Yes ☐ No ☒ N/A ☐

Comments: The project sample was sent to Eurofins Eaton Analytical, LLC (Eurofins) in South Bend, IN for analysis. This lab does not have a CS-LAP approval; however, the project sample is a drinking water sample and Eurofins is approved by DEC's drinking water program under certification IN00035 expiring 6/30/2025.

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?

Yes ☐ No ☐ N/A ☒

Comments: Samples were not transferred to another "network" laboratory or sub-contracted to an alternate laboratory.

2. Chain of Custody (CoC)

- a. Is the CoC information completed, signed, and dated (including released/received by)?

Yes ☒ No ☐ N/A ☐

Comments:

- b. Were the correct analyses requested?

Yes ☒ No ☐ N/A ☐

Analyses requested: VOCs by 524.2, Anions by 300.0, metals by 200.7 and 200.8, mercury by 245.1, pH by 150.1, cyanide by 335.4, nitrite/nitrate by 353.2, color by SM2120B, total alkalinity by SM2320B, total dissolved solids by SM2540C, fluoride by SM4500FC, and coliform by SM9223B.

CS Site Name: NA

Lab Report No.: 810-131289-1

Comments: Hardness by SM2340B and Langelier index by SM2330B were not listed on the but were reported and these are the correct analyses for the project. Data quality and/or usability not affected.

3. Laboratory Sample Receipt Documentation

- a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐

Cooler temperature(s): See below.

Sample temperature(s): See below.

Comments: A temperature blank was included with the cooler to assess temperature preservation. The temperature blank was reported at 1.8° C which is within the acceptable range.

- b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?

Yes ☒ No ☐ N/A ☐

Comments:

- c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?

Yes ☒ No ☐ N/A ☐

Comments: No sample condition discrepancies were noted by the lab.

- 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, canister not holding a vacuum, etc.?

Yes ☐ No ☒ N/A ☐

Comments: No discrepancies were noted by the laboratory.

- e. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: No laboratory sample receipt documentation discrepancies were noted by the laboratory.

4. Case Narrative

- a. Is the case narrative present and understandable?

Yes ☒ No ☐ N/A ☐

Comments:

- b. Are there discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐

Comments: Receipt Exceptions

CS Site Name: NA

Lab Report No.: 810-131289-1

The following sample(s) was received outside of holding time: Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result, the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis. See Section 5.b. for details regarding impacts to data quality and/or usability.

General Chemistry

Method 150.1: The following sample(s) was received outside of holding time: Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result, the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis. See Section 5.b. for details regarding impacts to data quality and/or usability.

Method 353.2: The following sample(s) was received outside of holding time: Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result, the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis. See Section 5.b. for details regarding impacts to data quality and/or usability.

Method Nitrate_Calc: The following sample(s) was received outside of holding time: Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result, the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis. See Section 5.b. for details regarding impacts to data quality and/or usability.

Method SM2330B: The Langlier Index result for B-1 (810-131289-1) was calculated using Lab pH and Default Temperature of 20 Degrees Celsius. Data quality and/or usability not affected.

Biology

Method 9223B_CIPA18_DW: The following sample(s) was received outside of holding time: Sample cooler wasn't marked with short hold sticker or a biology sticker. As a result, the cooler wasn't opened till 1110. which caused samples to be out of hold. Proceed with analysis. See Section 5.b. for details regarding impacts to data quality and/or usability.

- c. Were all the corrective actions documented?

Yes ☐ No ☐ N/A ☒

Comments: Corrective actions not required.

- d. What is the effect on data quality/usability according to the case narrative?

Comments: Effect on data quality and/or usability due to discrepancies, errors, or QC failures identified by the lab in the case narrative are either discussed above in Section 4.b. or elsewhere in this checklist.

CS Site Name: NA

Lab Report No.: 810-131289-1

5. Sample Results

- a. Are the correct analyses performed/reported as requested on CoC?

Yes ☒ No ☐ N/A ☐

Comments: VOCs by 524.2, Anions by 300.0, metals by 200.7 and 200.8, mercury by 245.1, pH by 150.1, cyanide by 335.4, nitrite/nitrate by 353.2, color by SM2120B, total alkalinity by SM2320B, total dissolved solids by SM2540C, fluoride by SM4500FC, and coliform by SM9223B were requested on the CoC. Hardness by SM2340B and Langelier index by SM2330B were not listed on the but were reported and these are the correct analyses for the project. Data quality and/or usability not affected.

- b. Are all applicable holding times met?

Yes ☐ No ☒ N/A ☐

Comments: pH, nitrite/nitrate, nitrate calculation, and coliform analyses were performed after the method specified holding times. Although some holding time exceedances are gross (greater than twice the method hold time), all results are being reported for informational purposes as estimates, no direction of bias, and are flags 'J*' in the analytical table. Data quality is considered affected; however, data is considered usable with the applied flags.

- c. Are all soils reported on a dry weight basis?

Yes ☐ No ☒ N/A ☐

Comments: Soil samples were not included with this work order.

- d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?

Yes ☐ No ☒ N/A ☐

Comments: Analytical sensitivity was evaluated to verify that reporting limits met applicable Federal MCLs or secondary MCLs for non-detect results, as appropriate. Analytes with RLs that do not meet applicable Federal MCLs are bolded in the analytical results table. Data quality and/or usability may be affected as these analytes cannot be detected, if present, at their respective MCL.

- e. Is the data quality or usability affected?

Yes ☒ No ☐ N/A ☐

Comments: See 5.d. above.

CS Site Name: NA

Lab Report No.: 810-131289-1

6. QC Samples

a. Method Blank

- i. Was one method blank reported per matrix, analysis, and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: Method blanks were not reported for hardness, pH, color, or Langelier index. Hardness and Langelier index are calculations and do not include method blanks. Color and pH methods do not include method blanks. Data quality and/or usability not affected.

- ii. Are all method blank results less than LOQ (or RL)?

Yes ☒ No ☐

Comments: No analytes were detected in method blank samples.

- iii. If above LoQ or RL, what samples are affected?

Comments: Not applicable, no analytes were detected in method blank samples.

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments: No analytes were detected in method blank samples.

- v. Data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: No analytes were detected in method blank samples.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics – Are 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: A laboratory duplicate was included for VOC analysis.

- ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: LCS and LLCs were reported for anions, metals, cyanide, nitrite/nitrate, total alkalinity and fluoride analyses.

A LCS was reported for mercury and total dissolved solids.

CS Site Name: NA

Lab Report No.: 810-131289-1

- iii. Accuracy – Are 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:

- iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the 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:

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: %Rs and RPDs were within limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments: No samples are affected.

- vii. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: %Rs and RPDs were within limits.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments:

- ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments: MS/MSD samples were reported for nitrite/nitrate analysis.

- iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐

Comments:

CS Site Name: NA

Lab Report No.: 810-131289-1

- iv. Precision – Are 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:

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: Not applicable, %Rs and RPDs were within limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments: No samples are affected.

- vii. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: %Rs and RPDs were within limits.

- 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:

- ii. Accuracy – Are 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:

- 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 samples had failed surrogate recoveries.

- iv. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: %Rs were within limits.

CS Site Name: NA

Lab Report No.: 810-131289-1

e. Trip Blanks

- i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples?

Yes ☒ No ☐ N/A ☐

Comments:

- ii. Are all results less than LoQ or RL?

Yes ☒ No ☐ N/A ☐

Comments:

- iii. If above LoQ or RL, what samples are affected?

Comments: No analytes were detected in the trip blank sample.

- iv. Is the data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: No analytes were detected in the trip blank sample.

f. Field Duplicate

- i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?

Yes ☐ No ☒ N/A ☐

Comments: Field duplicate samples were not collected or required for this project.

- ii. Was the duplicate submitted blind to lab?

Yes ☐ No ☒ N/A ☐

Comments: Field duplicate samples were not collected or required for this project.

- iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes ☐ No ☐ N/A ☒

Comments: Field duplicate samples were not collected or required for this project.

CS Site Name: NA

Lab Report No.: 810-131289-1

iv. Is the data quality or usability affected? (Explain)

Yes ☐ No ☒ N/A ☐

Comments: Field duplicate samples were not collected or required for this project.

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?

Yes ☐ No ☒ N/A ☐

Comments: The water sample was the only one collected for this project, so no equipment blank was collected.

ii. Are all results less than LoQ or RL?

Yes ☐ No ☐ N/A ☒

Comments: An equipment blank was not collected.

iii. If above LoQ or RL, specify what samples are affected.

Comments: Not applicable, an equipment blank was not collected.

iv. Are data quality or usability affected?

Yes ☐ No ☒ N/A ☐

Comments: An equipment blank was not collected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?

Yes ☐ No ☐ N/A ☒

Comments: Other data flags/qualifiers not required.

Quality Assurance/Quality Control Summary

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APPENDIX F: QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

°C	degrees Celcius
AAC	Alaska Administrative Code
AK	Alaska Method
CCV	continuing calibration verification
CFR	Code of Federal Regulation
CoC	chain-of-custody
DEC	Alaska Deparemnt of Environmetnal Conservation
DoD	U.S. Department of Defense
DQO	data quality objective
DRO	diesel range organics
GRO	gasoline range organics
IDA	isotope dilution analytes
LCS	laboraotry control sample
LCSD	laboroatry control sample duplicate
LDRC	labroatory data review checklist
LOD	limit of detection
LOQ	limit of quantitation
MCL	Maximum Contaminant Level
MS	matrix spike
MSD	matrix spike duplicate
MRL	method reporting limit
PCB	polychlorinated biphenyl
PAH	polycyclic aromatic hydrocarbon
PFAS	per- and polyfluoroalkyl substances
PQL	practical quantitation limit
QA	quality assurance
QC	quality control
QSM	Quality Systems Manual
RL	reporting limt
RPD	relative percent difference
RRO	residual range organics
SMCL	Secondary Maximum Contaminant Level
VOC	volatile orgainc compounds
WO	work order

F.1 INTRODUCTION

This quality assurance/quality control (QA/QC) summary outlines the technical review of analytical results generated in support of the Yakutat Water Line Extension project conducted in December 2024.

We reviewed project samples and QC analytical data to assess whether the data met the designated data quality objectives (DQOs) and were acceptable for project use. The project data was reviewed for deviations to the requirements presented in *Final – Yakutat Airport Water Line Extension Exploration Phase Sampling and Analysis Plan*, approved by the Alaska Department of Environmental Conservation (DEC) in August 2024. As appropriate, the review includes evaluation of sample collection and handling, holding times, blanks, project sample and laboratory QC sample duplicates, laboratory control samples (LCSs) and sample surrogate or isotope dilution analyte (IDA) recoveries, and matrix spike sample (MS) recoveries. Calibration curves and continuing calibration verification recoveries were not reviewed unless a QC discrepancy was noted by the laboratory in a case narrative. Full data quality descriptions are reported in the DEC Laboratory Data Review Checklists (LDRC) prepared for each laboratory report. LDRCs and laboratory reports are included in Appendix C, D, and E.

Soil limits of detection (LODs) or reporting limits (RLs) were compared to the most stringent values between the DEC cleanup levels in 18 Alaska Administrative Code (AAC) 75.341 Table B1 and B2 Method Two (Migration to Groundwater or Over 40 Inch Zone Human Health). Aside from per- and polyfluoroalkyl substances (PFAS), drinking water RLs were compared to Drinking Water Standards obtained from the U.S. Environmental Protection Agency's 40 code of Federal regulation (CFR) 141 for Maximum Contaminant Levels (MCLs) and 40 CFR 143 for Secondary Maximum Contaminant Levels (SMCLs). PFAS drinking water RLs were compared to Drinking Water Standards obtained from the EPA PFAS National Primary Drinking Water Regulation dated April 2024.

Soil data quality is discussed in Section F.2, below. Drinking water data quality is discussed in Section F.3, below. Data which did not meet acceptance criteria have been described, and the associated samples and data quality implications or qualifications are summarized.

F.1.1 Analytical Methods and Data Quality Objectives

The analytical methods and associated DQOs used for this review were established in the Work Plan. The DQOs represent the minimum acceptable QC limits and goals for analytical

measurements and are used as comparison criteria during data quality review to determine both the quality and usability of the analytical data.

The six DQOs used for this review were accuracy, precision, representativeness, comparability, sensitivity, and completeness.

- Accuracy measures the correctness, or the closeness, between the true value and the quantity detected. It is measured by calculating the percent recovery of known concentrations of spiked compounds that were introduced into the appropriate sample matrix. IDA, LCS, and MS sample recoveries are used to measure accuracy.
- Precision measures the reproducibility of repetitive measurements. It is measured by calculating the relative percent difference (RPD) between duplicate samples. Laboratory duplicate samples, field duplicate samples, MS and matrix spike duplicate sample (MSD) sample pairs, and LCS and laboratory control sample duplicate (LCSD) pairs are used to measure precision.
- Representativeness describes the degree to which data accurately and precisely represents site characteristics. This is addressed in more detail in the following section(s).
- Comparability describes whether two data sets can be considered equivalent with respect to the project goal. This is addressed in more detail in the following section(s).
- Sensitivity describes the lowest concentration that the analytical method can reliably quantitate and is evaluated by verifying that the detected results and/or limits of detection meet the project-specific cleanup levels and/or screening levels.
- Completeness describes the amount of valid data obtained from the sampling event(s). It is calculated as the percentage of valid measurements compared to the total number of measurements. The completeness goal for this project was set at 90 percent.

In addition to these criteria for the six DQOs described above, sample collection and handling procedures and blank samples were reviewed to ensure overall data quality. Sample collection forms were reviewed to verify that representative samples were collected, and samples were without headspace (if applicable). Sample handling was reviewed to assess parameters such as chain-of-custody documentation, the use of appropriate sample containers and preservatives, shipment cooler temperature, and method-specified sample holding times. Each of these parameters contributes to the general representativeness and comparability of the project data. The combination of evaluations of the above-mentioned items leads to a determination of the overall project data completeness.

F.1.2 Data Qualifiers

Exhibit F-1, below, outlines general flagging criteria used for this project, listed in increasing severity, to indicate QC deficiencies. Data are qualified pursuant to findings determined in the review of project data.

Exhibit F-1: Definition of Flags

Flag	Displayed as	Description
U	< [RL]	The analyte was not detected; the result is listed as less than the RL ¹ .
UJ	< [RL] J*	The analyte was not detected; the listed RL may not represent the true reporting limit due to sample-handling or laboratory QC failures (i.e., the listed reporting limit may be inaccurate or imprecise).
UB	< [RL or reported concentration] B*	The analyte is considered not detected due to sample-contamination identified in a blank; the result is listed as less than the RL or the concentration originally reported in the sample, whichever is greater.
UN	<[RL] N*	The analyte was not detected; the analyte was tentatively not identified, and the not-detected result is an estimated quantity.
J	[Result] J – Flag applied by laboratory [Result] J* – Flag applied by reviewer	The result is an estimated quantity. The analyte was detected below the LOQ or was affected by QC failures.
JL	[Result] JL*	The result is considered an estimated quantity and may be biased low due to QC failures.
JH	[Result] JH*	The result is considered an estimated quantity and may be biased high due to QC failures.
N	[Result] N*	The analyte was tentatively identified, and the result is considered an estimated quantity affected by QC failures.
R	R*	The results are unusable. The sample results are rejected due to severe QC deficiencies. The analyte may or may not be present in the sample.

NOTES:

1 The RL could be the LOQ, PQL or MRL. LOQ, PQL, and MRL are interchangeable terms. Which term is used depends on the laboratory reporting the results.

* Flag applied by reviewer.

LOQ = limit of quantitation, MRL = method reporting limit, PQL = practical quantitation limit, QC = quality control, RL = reporting limit

F.1.3 Summary of Soil Samples

A total of six soil samples were collected from soil borings advanced during December 2024. A trip blank sample was inadvertently not included with the cooler containing samples for volatile analyses. The collection of an equipment blank sample was not required as soil samples were collected employing new, disposable boring liners and clean, stainless-steel

spoons at each boring and sample interval. Soil samples were analyzed by one or more of the following analytical methods:

- per- and polyfluoroalkyl substances (PFAS) by LCMSMS compliant with the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.3 Table B-15,
- gasoline range organics (GRO) by Alaska Method (AK)101,
- diesel range organics (DRO) by AK102,
- residual range organics (RRO) by AK103,
- volatile organic compounds (VOCs) by SW8260D,
- polycyclic aromatic hydrocarbons (PAHs) by SW8270-SIM
- polychlorinated biphenyls (PCBs) by SW8082A, and
- Lead by SW6020.

Project and QC samples for PFAS were analyzed by Eurofins Sacramento in West Sacramento, California under DEC contaminated sites laboratory approval program approval 17-020. Project and QC samples for the remaining parameters were analyzed by Eurofins Seattle is Tacoma, Washington under DEC contaminated sites laboratory approval program approval 20-004.

PFAS soil samples were shipped via FedEx directly to Eurofins Sacramento. The remaining parameters soil samples were shipped to Eurofins Seattle via Alaska Airlines Goldstreak. The laboratory reports were assigned the following work order (WO) numbers:

- Eurofins Sacramento: 320-117793-1 and
- Eurofins Seattle: 580-146688-1 Revision 1

The laboratory reports and associated DEC LDRCs are included in Appendix C and D. Soil sample data quality is discussed in Section F.2. Please reference the LDRCs for additional information.

F.1.4 Summary of Drinking Water Samples

A total of one drinking water sample was collected from the temporary well point installed near the future pumphouse location during December 2024, boring B-1. The collection of an equipment blank sample was not required as only one sample was collected using a submersible pump. The drinking water sample was analyzed for the following drinking water methods:

- VOCs by 524.2,
- anions by 300.0,

- metals by 200.7 and 200.8,
- mercury by 245.1,
- pH by 150.1,
- cyanide by 335.4,
- nitrite/nitrate by 353.2,
- color by SM2120B,
- total alkalinity by SM2320B,
- total dissolved solids by SM2540C,
- fluoride by SM4500FC,
- coliform by SM9223B,
- Hardness by SM2340B,
- Langelier index by SM2330B, and
- PFAS by 1633.

The drinking water sample was shipped via Alaska Airlines Goldstreak to Eurofins Eaton Analytical, LLC in South Bend, Indiana under DEC's drinking water program certification IN00035. The laboratory assigned 810-131289-1 as the WO number.

The laboratory report and associated DEC LDRC is included in Appendix E. Drinking water sample data quality is discussed in Section F.3.

F.2 SOIL DATA QUALITY REVIEW

This section presents the findings of the data quality review and the resulting data qualifications for soil samples. Soil samples were analyzed by Eurofins Sacramento under WO 320-117793-1 and Eurofins Seattle under WO 580-146688-1 Revision 1. See the associated LDRCs in Appendix C and D for more elaborate data quality descriptions.

F.2.1 Sample Collection

Soil sample collection associated with boring activities was recorded on soil boring logs provided in Appendix A. The collection of an equipment blank sample was not required as soil samples were collected employing new, disposable boring liners and new, stainless-steel spoons at each boring and sample interval. No sample collection discrepancies were noted.

F.2.2 Sample Handling

The evaluation of proper sample handling procedures includes verification of the following: correct chain-of-custody (CoC) documentation, appropriate sample containers and preservatives, cooler temperatures maintained within the DEC-recommended temperature range (0 to 6 degrees Celsius [°C]), and sample analyses performed within method-specified holding times. The following discrepancies were observed.

- WO 580-146688-1 Revision 1: The lab signed the next relinquished by section of the CoC instead of the received by section of the CoC at sample login. Analyses performed as requested. Data quality and/or usability not affected.
- WO 320-117793-1: The container label for the following sample did not match the information listed on the CoC: B-21 (320-117793-2). The container label lists the following time: 10:45. The sample was logged in and labeled according to the CoC. Data quality and/or usability not affected.

F.2.3 Blanks

Method blanks were utilized to detect potential cross-contamination of project samples. Method blanks detect laboratory cross-contamination. A trip blank sample was inadvertently not included with the cooler containing samples for volatile analyses. The collection of an equipment blank sample was not required as soil samples were collected employing new, disposable boring liners and clean, stainless-steel spoons at each boring and sample interval. The following method blank detections were identified.

- WO 580-146688-1 Revision 1: The following analytes were detected in their respective method blank samples below the LOQ: VOC analyte 1,2,4-Trimethylbenzene and VOC-SIM analytes 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,4-Dichlorobenzene, Bromoform, Chlorodibromomethane, Dichlorobromomethane, Hexachlorobutadiene, 1,1,2-Trichloroethane, Dibromomethane, Tetrachloroethene, Trichloroethene, and Ethylene Dibromide.
 - 1,2,4-Trimethylbenzene was not detected in associated sample B-23 analyzed with the method blank sample for batch 580-480913. Data quality and/or usability not affected.
 - 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,4-Dichlorobenzene, Bromoform, Chlorodibromomethane, Dichlorobromomethane, Hexachlorobutadiene, and 1,1,2-Trichloroethane were not detected in associated sample B-23 analyzed with the method blank sample for batch 580-481242. Data quality and/or usability not affected.
 - Dibromomethane, Tetrachloroethene, and Trichloroethene were detected below the LOQ and within ten times the concentration detected in the method blank sample for batch 580-481242 in associated sample B-23. Consequently, the results of these analytes in the noted sample are considered not detected due to method blank

contamination and are reported at the LOQ and are flagged 'B*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with the applied flags.

- Ethylene dibromide was detected above the LOQ and within ten times the concentration detected in the method blank sample for batch 580-481242 in associated sample B-23. Consequently, the result of this analyte in the noted sample is considered an estimate, biased high, and is flagged 'JH*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with the applied flags.

F.2.4 Laboratory Control Samples

The LCS/LCSD samples were prepared by adding spike compounds to blank samples to assess laboratory extraction and instrumentation performance. LCS and/or LCSD accuracy and precision were within the established control limits with the following exceptions.

- WO 580-146688-1 Revision 1: The VOC LCS/LCSD RPD for acetone was outside laboratory limits for batch 580-480913. Acetone was not detected in the associated project sample B-23; therefore, the result of this analyte in the noted sample is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected, however, data is considered usable with applied flags.

F.2.5 Matrix Spike Samples

MS samples were prepared by adding spike compounds to project samples to assess potential matrix interference. Where performed, the accuracy of analyte recoveries for MS and MSD samples and the precision of the MS/MSD samples were within the established control limits with the following exception.

- WO 580-146688-1 Revision 1: The MS recovery for DRO in parent sample B-23 was above laboratory limits. The DRO concentration in the parent sample was much larger than the spike concentration added. The spike therefore could not be quantified against the background concentration. Data quality and/or usability not affected.

F.2.6 Surrogates

Surrogates (compounds similar to the analytes of interest) were added to some project samples by the laboratory prior to sample extraction, in accordance with method requirements. Surrogate recoveries were then calculated as percentages and reported by the laboratory as a measure of analytical extraction efficiency. Surrogate recoveries were within the established control limits.

F.2.7 IDAs

IDA compounds were added to PFAS project samples by the laboratory prior to analysis in accordance with method requirements. IDAs were then calculated as percentages and reported by the laboratory as a measure of extraction and analytical efficiency, and to evaluate potential matrix interference associated with a specific analyte of interest. IDA recoveries were within control limits for the soil project samples with the following exception.

- WO 320-117793-1: Percent recoveries for 13C2 PFTeDA were below acceptance limits in the MS sample for 537M and the parent sample B-20. The analyte associated with 13C2 PFTeDa is PFTeA. PFTeA was not detected in the parent samples. Consequently, the result of this analyte in the noted sample is considered estimated, no direction of bias, and have been flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

F.2.8 Field Duplicates

A field duplicate pair was inadvertently not collected during field activities.

F.2.9 Other Quality Control Discrepancies

The following additional quality control discrepancies were identified.

- WO 580-146688-1 Revision 1
 - The continuing calibration verification (CCV) associated with batch 580-481244 exhibited low recovery for vinyl chloride. A RL standard was analyzed, and the target analytes were detected. Since the associated samples were non-detect for vinyl chloride, the data are reported. Consequently, the vinyl chloride result in sample B-23 is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.
 - The CCV associated with batch 580-481244 exhibited elevated recovery for Naphthalene. The samples associated with this CCV were non-detect; therefore, the data have been reported. Consequently, the naphthalene result of sample B-23 is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.
- WO 320-117793-1: The "I" qualifier means the transition mass ratio for the indicated analyte was outside the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. The associated analyte(s) have been flagged: B-22 (320-117793-3) and (320-117793-A-1-C MSD). Consequently, the PFHxS result in the noted sample is considered an estimate, no direction of bias, and is flagged 'J*' in the

analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

F.2.10 Analytical Sensitivity

Analytical sensitivity was evaluated to verify that LODs or RLs met applicable DEC's most stringent values between the DEC cleanup levels in 18 AAC 75.341 Table B1 and B2 Method Two (Migration to Groundwater or Over 40 Inch Zone Human Health) for non-detect results, as appropriate. Analytes with LODs that do not meet applicable cleanup levels are bolded in the analytical results table. Data quality and/or usability may be affected as these analytes cannot be detected, if present, at their respective cleanup level.

F.2.11 Summary of Qualified Results

Overall, the data validation process deemed the soil data acceptable for use with applied flags, as noted.

F.2.12 Completeness

Overall, the data validation process deemed the soil data acceptable for use. No data were rejected pursuant to the data quality review, and data may be used as applicable for the purposes of the Yakutat Water Line Expansion Environmental Summary Report.

F.3 DRINKING WATER DATA QUALITY REVIEW

This section presents the findings of the data quality review and the resulting data qualifications for the drinking water sample. See the associated LDRC in Appendix E for more elaborate data quality descriptions. The drinking water sample was analyzed by Eurofins Eaton Analytical, LLC in South Bend, Indiana and was included in one WOs (810-131289-1).

F.3.1 Sample Collection

Drinking water sample collection forms were reviewed to confirm samples were collected properly. Water quality parameters were not collected during development, rather the TWP was purged until the water was clear and at least three well volumes had passed through.

F.3.2 Sample Handling

The evaluation of proper sample handling procedures includes verification of the following: correct chain-of-custody documentation, appropriate sample containers and preservatives, cooler temperatures maintained within the DEC-recommended temperature range (0 to 6

°C), and sample analyses performed within method-specified holding times. The following sample handling discrepancies were noted upon receipt at the laboratory.

- WO 320-117793-1: pH, nitrite/nitrate, nitrate calculation, and coliform analyses were performed after the method specified holding times. Although some holding time exceedances are gross (greater than twice the method hold time), all results are being reported for informational purposes as estimates, no direction of bias, and are flags 'J*' in the analytical table. Data quality is considered affected; however, data is considered usable with the applied flags.

F.3.3 Method Blanks

Method blanks were utilized to detect potential laboratory cross-contamination of project samples. Project samples are considered affected if results are detected within ten times the concentration of the detection in the method blank. Method blanks were not reported for hardness, pH, color, or Langelier index. Hardness and Langelier index are calculations and do not include method blanks. Color and pH methods do not include method blanks. Data quality and/or usability not affected. No analytes were detected in method blank samples.

F.3.4 Laboratory Control Samples

The LCS/LCSD samples were prepared by adding spike compounds to blank samples to assess laboratory extraction and instrumentation performance. LCS/LCSD recoveries and/or RPDs were within laboratory and project limits with the following exception.

- WO 320-117793-1: The PFAS LCS/LCSD precision was outside the data quality objective for NFDHA by method 1633. NFDHA was not detected in the associated project sample B-1. Consequently, the NFDHA result in the noted sample is considered an estimate, no direction of bias, and is flagged 'J*' in the analytical table. Data quality is considered affected as noted, however, data is considered usable with applied flags.

F.3.5 Surrogates

Surrogates (compounds similar to the analytes of interest) were added to some project samples by the laboratory prior to sample extraction, in accordance with method requirements. Surrogate recoveries were then calculated as percentages and reported by the laboratory as a measure of analytical extraction efficiency. Surrogate recoveries were within the established control limits.

F.3.6 IDAs

IDA compounds were added to project samples by the laboratory prior to analysis, in accordance with method requirements. IDAs were then calculated as percentages and reported by the laboratory as a measure of extraction and analytical efficiency, and to

evaluate potential matrix interference associated with a specific analyte of interest. IDA recoveries were within the established control limits.

F.3.7 Field Duplicates

Field duplicate samples were not a part of the scope of drinking water sample collection.

F.3.8 Analytical Sensitivity

Analytical sensitivity was evaluated to verify that reporting limits met applicable Federal MCLs, SMCLs, or PRAS Drinking Water Standards obtained from the EPA PFAS National Primary Drinking Water Regulation dated April 2024 for non-detect results, as appropriate. Analytes with RLs that do not meet applicable limits are bolded in the analytical results table. Data quality and/or usability may be affected as these analytes cannot be detected, if present, at their respective MCL.

F.3.9 Summary of Qualified Results

Overall, the data validation process deemed the drinking water data acceptable for use with applied flags.

F.3.10 Completeness

Overall, the data validation process deemed the drinking water data acceptable for use. No data were rejected pursuant to the data quality review, and data may be used as applicable for the purposes of the Yakutat Water Line Expansion Environmental Summary Report.

IMPORTANT INFORMATION

Important Information

About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

IMPORTANT INFORMATION

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

Appendix B

Contaminated Media Transport and Treatment or Disposal Approval Form

Can be accessed online at <https://dec.alaska.gov/spar/csp/offsite-remediation/ttd-form>

APPENDIX B: CONTAMINATED MEDIA APPROVAL FORM



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites and Prevention Preparedness and Response Programs
Contaminated Media Transport and Treatment or Disposal Approval Form

HAZARD ID # or SPILL ID #		NAME OF CONTAMINATED SITE OR SPILL	
CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION			
CURRENT PHYSICAL LOCATION OF MEDIA		SOURCE OF THE CONTAMINATION (DAY TANK, FIRE TRAINING PIT, LUST, ETC.)	
CONTAMINANTS OF CONCERN	ESTIMATED VOLUME	DATE(S) GENERATED	
POST TREATMENT ANALYSIS REQUIRED <i>(such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)</i>			
COMMENTS OR OTHER IMPORTANT INFORMATION			

TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA	PHYSICAL ADDRESS/PHONE NUMBER
PARTY CONDUCTING CLEANUP	ADDRESS/PHONE NUMBER
WASTE MANAGEMENT COMPANY	ADDRESS/PHONE NUMBER

***Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.**

Name of the Person Requesting Approval (printed)

Title/Association

Signature

Date

Phone Number

-----**DEC USE ONLY**-----

Based on the information provided, ADEC approves transport of the above mentioned material. The party conducting the cleanup or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

DEC Project Manager Name (printed)

Project Manager Title

Signature

Date

Phone Number

Instructions to Complete

Contaminated Media Transport and Treatment or Disposal Approval Form

The Alaska Department of Environmental Conservation (DEC) must approve the movement or disposal of contaminated soil and water from a site in accordance with 18 Alaska Administrative Code (AAC) 75.325(i), 18 AAC 75.370(b), and 18 AAC 78.274(b). The *Contaminated Media Transport and Treatment or Disposal Approval Form* should be used to document this approval. Soil treatment facilities regulated under 18 AAC 75.365 are required by their Operations Plans to only accept contaminated soil for which an approval form has been signed by a DEC project manager.

Site information can be found on the Contaminated Site Database (www.alaska.gov/Applications/SPAR/PublicMVC/CSP/Search/) or the Spills Database (<http://dec.alaska.gov/Applications/SPAR/PublicMVC/PERP/SpillSearch/>).

Instructions to Complete:

1. **Hazard ID or Spill ID #:** For a contaminated site, the Hazard ID can be found on the Contaminated Sites Database. For a spill, the Spill ID can be found in the subject line of letters from DEC or the Spills Database. If the waste originates from multiple sites, all Hazard IDs or Spill IDs must be listed.
2. **Name of Contaminated Site or Spill:** For a contaminated site, the official site name can be found on the Contaminated Sites Database. For a spill, the official name of the spill is found in the subject line of letters from DEC or the Spills Database.
3. **Contaminated Site or Spill Location – Address or Other Appropriate Description:** This address or description captures the origin of the contaminated media or the location of the spill. For a contaminated site, the address or other appropriate description can be found on the Contaminated Sites Database. For a spill, this can be found on the Spill Report or the Spills Database.
4. **Current Physical Location of the Media:** Provide the physical location where the contaminated media (soil, water, etc.) is currently stored. This location may be the same as location provided in the “Contaminated Site or Spill Location”, or it could be a hazardous waste facility or other location/staging area agreed upon in the DEC-approved work plan.
5. **Source of Contamination (Day Tank, Fire Training Pit, LUST, etc.):** List all sources which contributed to the contamination in the media being transported. Sources can include previous releases that have comingled. If the source is unknown, state “Unknown”.
6. **Contaminants of Concern (CoCs):** List all contaminants detected above the most stringent Method 2 Tables B1 and B2 soil cleanup levels in 18 AAC 75.341(c) and (d), the Table C groundwater cleanup levels in 18 AAC 75.345, and other applicable action levels (e.g., TCLP results). Attach the laboratory data package for the contaminated media that is being disposed of and, if applicable, a data summary table or narrative to this form. Data gathered during site characterization activities may be sufficient to determine the CoCs. There are situations in which generator knowledge of the contaminant source may be accepted by a treatment or disposal facility in lieu of analytical sample results, such as, diesel-impacted media from a heating oil tank. If you are using generator knowledge in lieu of analytical sample results, include a statement which documents this knowledge in the Comments section.

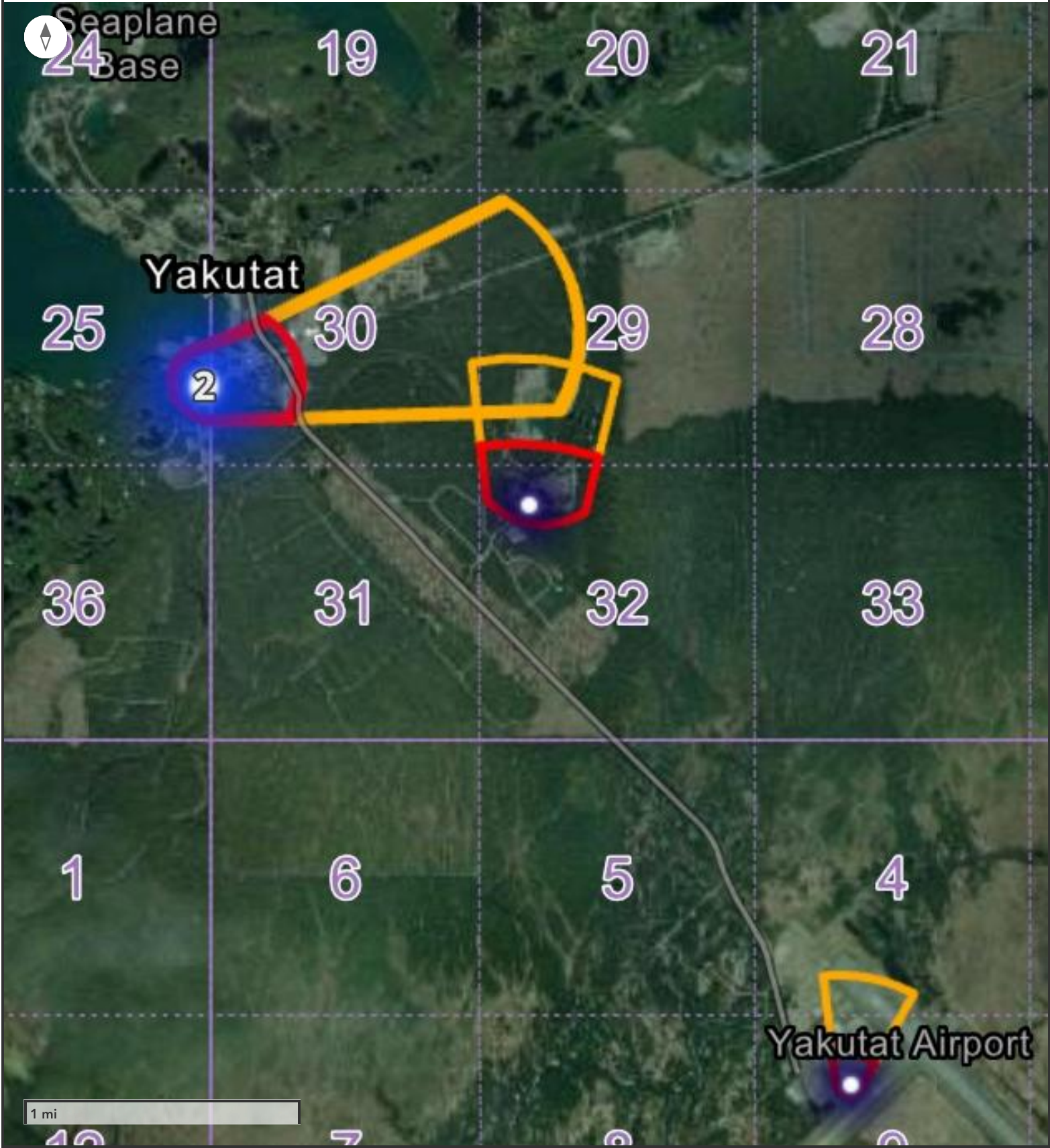
7. **Estimated Volume:** Include the total volume of contaminated media to be transported; for instance, "Nine 55-gallon drums" or "25 cubic yards of soil."
8. **Date(s) Generated:** Provide the date the media was generated (e.g., excavated, pumped out of the ground, etc.). If the media was generated over multiple days, list the range of dates.
9. **Post Treatment Analysis Required (such as GRO, DRO, RRO, VOCs, PAHs, metals, PFAS, chlorinated solvents, etc.):** Provide the list of all contaminants that exceed the most stringent Method 2 cleanup levels. For DEC-approved soil treatment facilities in Alaska, specific post treatment analyses will be determined by the facility based upon the contaminants and requirements of their Operations Plan. If the media are being transported to a landfill or permitted liquid waste facility without off-site treatment, include "Not Applicable".
10. **Comments or Other Important Information:** Provide any other information which needs to be conveyed.
 - a. If generator knowledge of the CoCs is being used in lieu of sample analytical results, an explanation needs to be provided in this field.
 - b. If the material is going to be placed in a landfill in Alaska, include a statement that the landfill has agreed to accept the material and provide the contact information for the landfill point of contact. If the material is going to be placed in a Class 2 or 3 landfill, attach the DEC Solid Waste Program's approval letter to this form.
 - c. If the media is going to an intermediate location or facility prior to its final destination, describe the complete transportation route with intermediate locations in this field.
11. **Treatment Facility, Landfill, and/or Final Destination of Media:** Include the name of the facility, landfill, or the final destination of the media. A list of DEC-approved Alaskan soil treatment facilities is available at www.dec.alaska.gov/spar/csp/offsite-remediation/. If multiple treatment facilities will be used, use separate forms to document what media will go to which facility. For material that will go to a waste transfer facility prior to disposal at another facility, the final destination should be listed.
 - a. **Physical Address/Phone Number:** Provide the physical location and telephone number of the facility, landfill, or the final destination of the media.
12. **Party Conducting Cleanup:** Provide the name of the entity overseeing the project, typically this is the party responsible for the spill or could be a party which has received grant funding to conduct cleanup.
 - a. **Address/Phone Number:** Provide the contact information for the party conducting the cleanup.
13. **Waste Management Company:** Provide the name of company or person shipping and/or organizing the shipment of the media.
 - a. **Address/Phone Number:** Provide the mailing address and telephone number of the waste management company or organizer.

Submit this completed form along with all necessary attachments to the assigned DEC project manager for approval, or contact the Contaminated Sites Program at (907) 269-7558 or the Prevention, Preparedness and Response Program at (907) 269-7557.

Appendix C

Drinking Water Protection Zones Map

APPENDIX C: DRINKING WATER PROTECTION ZONES MAP



DEC - Drinking Water Program
Alaska DEC Public Water System Sources

Community Water System (CWS)

Non-Transient/Non-Community (NTNC)

Transient Non-Community (TNC)

Number of features
< 2> 2

Alaska DEC Drinking Water Protection Areas

Zone A (GW-Several Months Time of Travel or SW 1000 ft buffer)

Zone B (GW-2 Yr Time of Travel or SW-1 mile buffer)

Zone C Surface Water (Watershed Boundary)

Zone E Ground Water Surface Water Influence (1000 ft buffer)

Zone F Ground Water Surface Water Influence (1 mile buffer)

Zone G Ground Water Surface Water Influence (Watershed Boundary)

Provisional Protection Areas

Alaska River Breakup Status (CloudGIS)

APRFC River Breakup Status

Status

Unknown

Mostly Ice

Some Open

Mostly Open

Open

PLSS (MTRS) Township

Section

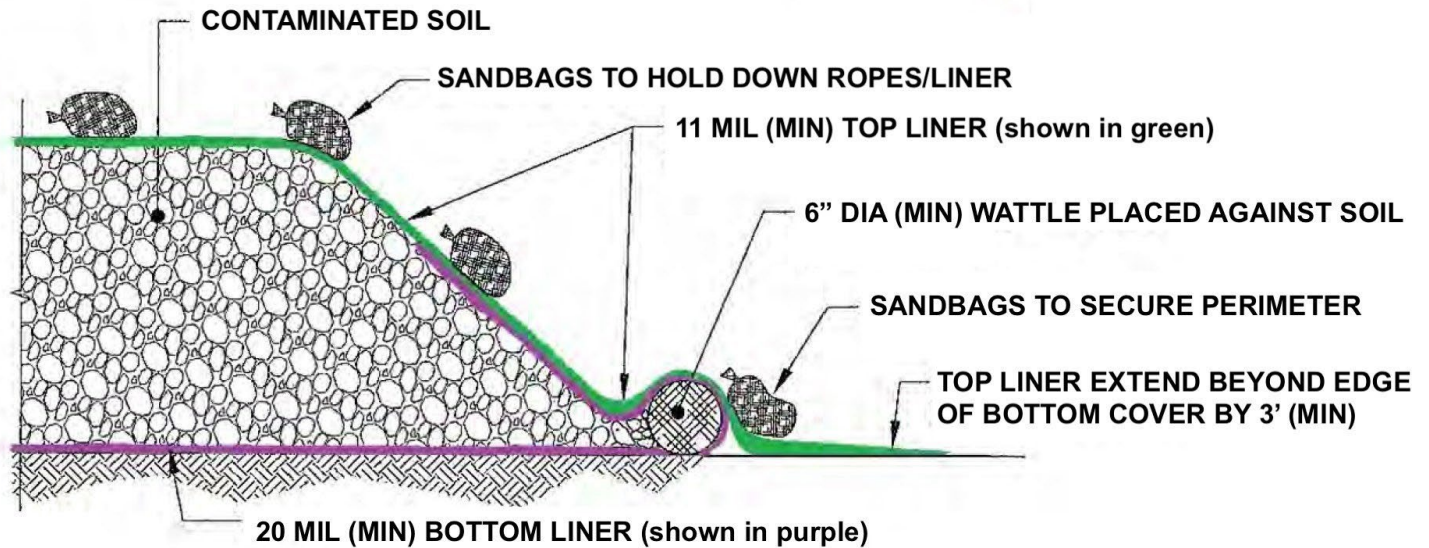
Parcels PropertyInformation Hosted

Appendix D

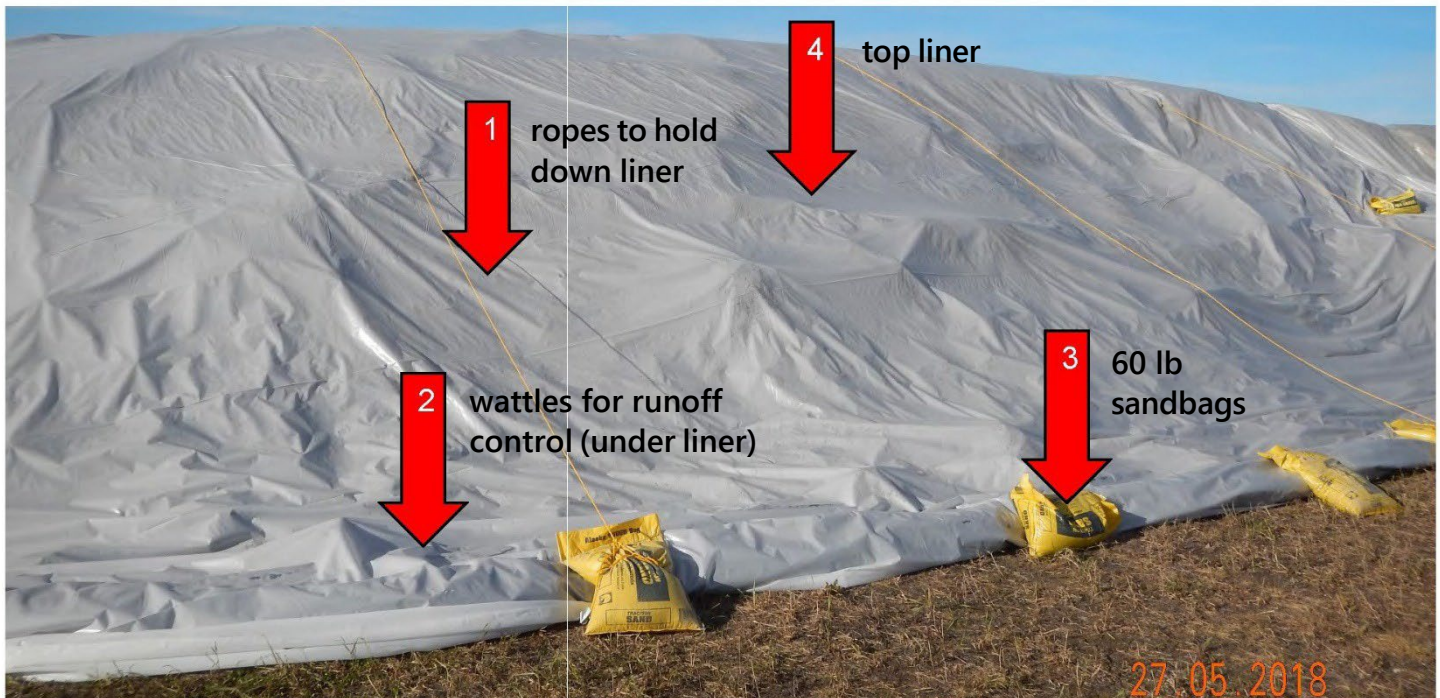
Stockpile Management Guide

APPENDIX D: STOCKPILE MANAGEMENT GUIDE

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 #]

PROJECT OWNER

[POC NAME] [POC PHONE #]

PROJECT NO.

GENERATION DATE: MONTH/DATE/YEAR

**POTENTIAL PFAS-
CONTAMINATED
MATERIAL
DO NOT DISTURB**

[CONTRACTOR COMPANY NAME]

[POC NAME] [POC PHONE #]

PROJECT OWNER

[POC NAME] [POC PHONE #]

PROJECT NO.

GENERATION DATE: MONTH/DATE/YEAR

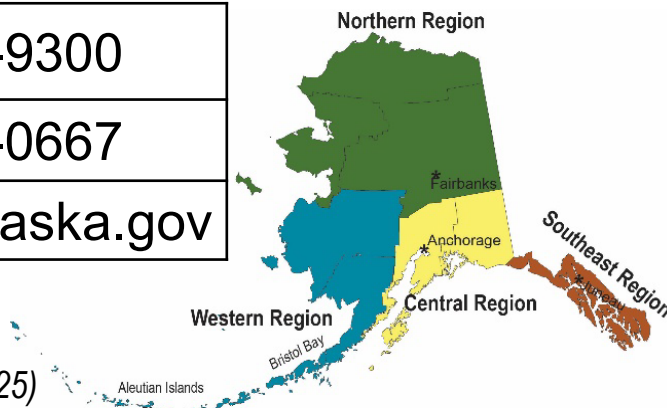
Appendix E

DEC Spill Reporting Placard

APPENDIX E: DEC SPILL REPORTING PLACARD

Report Oil and Hazardous Substance Spills

TOLL-FREE	1-800-478-9300
INTERNATIONAL	1-907-269-0667
ONLINE	ReportSpills.alaska.gov



It's Required by Alaska Law!

(AS 46.03.755, AS 46.03.450, 18 AAC 75.300, 18 AAC 75.325)

Oil and Petroleum Product Reporting

Spills to Water

- Any amount spilled to water must be reported **immediately**.

Spills to Land

- Spills in **excess of 55 gallons** must be reported **immediately**.
- Spills in **excess of 10 gallons but less than 55 gallons** must be reported within 48 hours.
- Facilities shall maintain a spill log and report a record of oil discharges from **1 to 10 gallons** monthly.

Spills to Impermeable Secondary Containment

- Spills in **excess of 55 gallons** must be reported within 48 hours.

Hazardous Substance Reporting

Any hazardous substance spill, other than oil, must be reported **immediately**.

Underground Storage Tank (UST)* Reporting

You must report a suspected below ground release from a UST system, in any amount, within 24 hours. (18 AAC 78.212)

If a release is suspected the owner or operator of a UST shall investigate the UST site and shall report to the UST Unit within the period specified. (18 AAC 78.200)

Contact us: (907) 465-5250

* Regulated UST as defined in AS 46.03.450(8)



Alaska Department of Environmental
Conservation
Division of Spill Prevention and Response
<https://spills.alaska.gov>

Revised 10/10/2022

Important Information

About Your Contaminated Materials Management Plan

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland



SUBSTITUTION REQUEST

(During the Bidding/Negotiating Stage)

Project: City & Borough of Yakutat Airport Water Substitution Request Number: _____

From: Aliyah Williams

To: Trent Mullins Date: 09/15/2025

RESPEC A/E Project Number: _____

Re: Product Substitution Request Contract For: _____

Specification Title: SECTION 133419 - METAL BU Description: Foam Insulated Metal Panels

Section: 2.02 Page: 5 Article/Paragraph: H
2.02

Proposed Substitution: All Weather Insulated Panels DM40

Manufacturer: All Weather Ins Address: 929 Aldridge Road, Vaca Phone: 7178475319

Trade Name: _____ Model No: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Aliyah Williams

Signed by: *Aliyah Williams*

Firm: All Weather Insulated Panels

Address: 929 Aldridge Road, Vacaville CA

Telephone: 7178475319

A/E's REVIEW AND ACTION

- ☒ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: TRENT MULLINS, RESPEC

Date:
09/15/2025

Supporting Data Attached: ☒ Drawings ☒ Product Data ☐ Samples ☒ Tests ☒ Reports ☐ _____



SUBSTITUTION REQUEST

(During the Bidding/Negotiating Stage)

Project: City & Borough of Yakutat Airport Water Substitution Request Number: _____
From: Aliyah Williams
To: Trent Mullins Date: 09/15/2025
RESPEC A/E Project Number: _____
Re: Product Substitution Request Contract For: _____
Specification Title: SECTION 133419 - METAL BU Description: Roof System
Section: 2.02 Page: 6 Article/Paragraph: 1
2.02

Proposed Substitution: All Weather Insulated Panels SR2
Manufacturer: All Weather Ins Address: 929 Aldridge Road, Vaca Phone: 7178475319
Trade Name: _____ Model No: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Aliyah Williams
Signed by: *Aliyah Williams*
Firm: All Weather Insulated Panels
Address: 929 Aldridge Road, Vacaville CA
Telephone: 7178475319

A/E's REVIEW AND ACTION

- ☒ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: TRENT MULLINS, RESPEC

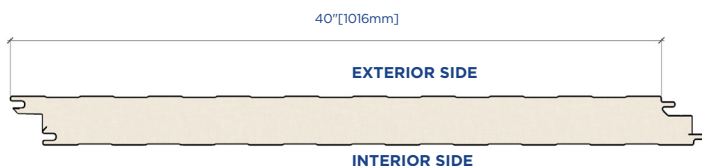
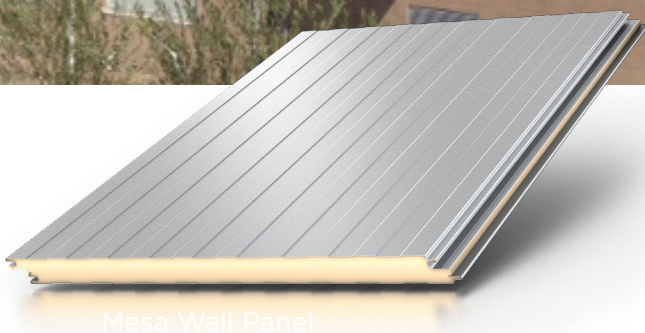
Date: 09/15/2025

Supporting Data Attached: ☒ Drawings ☒ Product Data ☐ Samples ☒ Tests ☒ Reports ☐ _____



Features & Benefits

- Highly efficient and flexible insulated metal panel design is ideal for commercial, industrial and controlled environment applications
- Provides long-term thermal, moisture and vapor transmission performance
- Panel joinery is designed to permit installation of the panel vertically or horizontally
- Composite panel simplifies design, reduces complexity, improves efficiency and reduces installation costs
- Single component wall design includes exterior aesthetic, weather barrier, insulation and vapor barrier



Product Specifications

Profile	Exterior	Embossed, Lightly Planked, Mesa Rib					
	Interior	Embossed, Lightly Planked, Mesa Rib					
Exterior Face Skin	26 Gauge G90/AZ50, Optional Gauges: 24 and 22 G90/AZ50, 26 304 2B Stainless Steel						
Interior Face Skin	26 Gauge G90/AZ50, Optional Gauges: 24 and 22 G90/AZ50, 26 304 2B Stainless Steel*						
Panel Module**	40"[1016mm]						
Lengths**	Minimum: 8'[2.44m], Maximum: 50'[15.24m]						
Side Lap	Double Tongue and Groove						
GWP±	5.6 to 10.5 Lb CO ₂ eq/ft² [27.2 to 51.2 kg CO ₂ eq/m²]						
Core Type	Polyisocyanurate/ PIR						
Thermal Performance†							
Thickness	2"[51mm]	2.5"[64mm]	3"[76mm]	4"[102mm]	5"[127mm]	6"[152mm]	8"[203mm]
R-Value @ 75°F mean (°F·ft²·h/BTU)	14.4	18.0	21.6	28.8	36.0	43.2	57.6
U-Value @ 75°F mean (BTU/°F·ft²·h)‡	0.102	0.088	0.073	0.044	0.033	0.022	0.023
R-Value @ 35°F mean (°F·ft²·h/BTU)	16.4	20.5	24.6	32.8	41.0	49.2	65.6
U-Value @ 35°F mean (BTU/°F·ft²·h)‡	0.093	0.078	0.064	0.034	0.027	0.020	0.018

* For interior applications only

** Contact AWIP for Custom Sizes

† R-values as tested per ASTM C518

‡ U-values as tested per ASTM C1363

± Per EPD based on TRACI method from cradle to gate(A1-A3). Lower range based on 2" 26/26 gauge panel. Higher limit based on 6" 22/22 gauge panel. Not all profiles are available in these specific configurations, contact AWIP for more information.

Testing & Approvals

Category	Test	Test Title	Results
Fire	FM 4880	Class 1 Fire Rating of Insulated Wall, Ceiling and Roof Panels	Passed: Class 1 Fire Rating of Building Panels or Interior Finish Material
	ASTM E84	Surface Burning Characteristics of Building Materials	Flame Spread Index: 25 or less Smoke Developed Index: 450 or less
	NFPA 285	Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies	Passed
	NFPA 286	Room Fire Growth for Wall and Ceiling Interior	Passed
	NFPA 268	Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source	Assembly tested meets the requirements of the standard
	CAN/ULC S101 - 15 min	Fire Endurance	Maximum 6"[152mm] thick. Vertical and horizontal orientations
	CAN/ULC S102	Flame Spread/Smoke Developed	FSI $\leq$ 20, SDI $\leq$ 195
	CAN/ULC S134	Exterior Wall Assembly	Maximum 6"[152mm] thick. Vertical orientations
	CAN/ULC S138	Room Corner Test	Maximum 6"[152mm] thick. Vertical and horizontal orientations
Water Penetration	ASTM E331	Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference	No uncontrolled water penetration at 20 PSF differential pressure for a duration of 2-hours
Air Infiltration	ASTM E283	Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors	<0.01 CFM/ft ² of Panel Area at 20 PSF
Structural	FM 4881	Class 1 Exterior Wall Systems	See FM Approval Guide or contact Technical Services Minimum 2.5"[64mm] thickness
	ASTM E72	Standard Test Methods of Conducting Strength Tests of Panels for Building Construction	See Span Tables
	ASTM E1592	Structural Performance for Sheet Metal and Sidings Systems by Uniform Static Air Pressure Difference	See Span Tables
Thermal	ASTM C518	Steady-State Thermal Transmission	Nominal R-value of 7.2 [hr·ft ² ·°F/Btu] per inch at 75°F mean temperature and 8.2 [hr·ft ² ·°F/Btu] per inch at 35°F mean temperature
	ASTM C1363	Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	U-values are tested with 2", 4", 6" and 8" thicknesses. U-values for other thicknesses are interpolated. See U-values in the table on page 1
Code Approvals	FBC	Florida Building Code	FL15060
	IAPMO	Various Building Codes	ER-301



Scan for the most current
product information

1 (888) 970-AWIP (2947)
awipanel.com
sales@awipanel.com

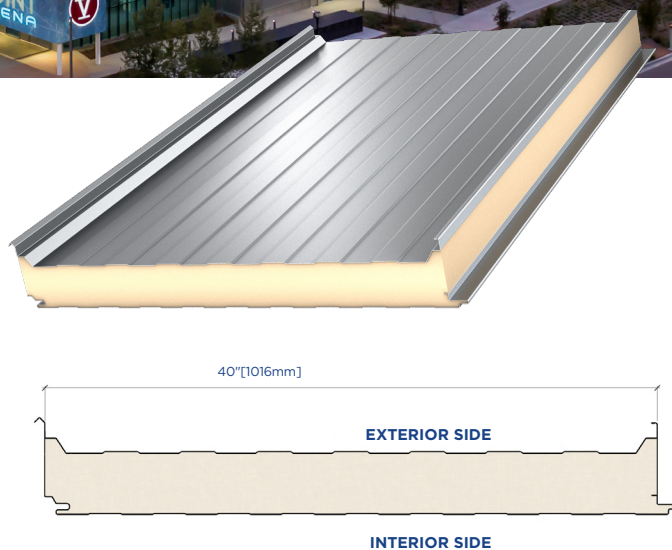


All Weather
Insulated Panels



Features & Benefits

- Field seamed, hidden fastener joinery provides clean appearance and protection against the elements
- Weathertight design for use in both retrofit or new construction applications
- Composite panel simplifies design, reduces complexity, improves efficiency and reduces installation costs
- Single component roof design includes exterior aesthetic, weather barrier, insulation and vapor barrier



Product Specifications

Profile	Exterior	Smooth		
	Interior	Embossed, Lightly Planked, Mesa Rib		
Exterior Face Skin	26 Gauge G90 Galvanized or AZ50 Galvalume. 24 and 22 Gauge optional			
Interior Face Skin	26 Gauge G90/AZ50, Optional Gauges: 24 and 22 G90/AZ50, 26 304 2B Stainless Steel*			
Slope Requirements**	Minimum 1/2: 12			
Panel Module	40"[1016mm]			
Lengths***	Minimum: 8'[2.44m], Maximum: 50'[15.24m]			
Side Lap	Exterior: Standing Seam Interior: Tongue and Groove			
GWP±	5.6 to 10.5 Lb CO ₂ eq/ft² [27.4 to 51.3 kg CO ₂ eq/m²]			
Core Type	Polyisocyanurate/ PIR			
Thermal Performance†				
Thickness	3.25"[82mm]	4"[102mm]	5"[127mm]	6"[125mm]
R-Value @ 75°F mean (°F·ft²·h/BTU)	23.4	28.8	36.0	43.2
U-Value @ 75°F mean (BTU/°F·ft²·h):	0.063	0.040	0.031	0.022
R-Value @ 35°F mean (°F·ft²·h/BTU)	26.6	32.8	41.0	49.2
U-Value @ 35°F mean (BTU/°F·ft²·h):	0.054	0.031	0.026	0.020

* For interior application only

** Contact AWIP for Custom Slope

*** Contact AWIP for Custom Sizes

† R-values as tested per ASTM C518

‡ U-values as tested per ASTM C1363

± Per EPD based on TRACI method from cradle to gate(A1-A3). Lower range based on 2" 26/26 gauge panel. Higher limit based on 6" 22/22 gauge panel. Not all profiles are available in these specific configurations, contact AWIP for more information.



All Weather
Insulated Panels

Testing & Approvals

Category	Test	Test Title	Results
Fire	FM4880	Class 1 Fire Rating of Insulated Wall, Ceiling and Roof Panels	Passed: Class 1 Fire Rating of Building Panels or Interior Finish Material
	NFPA 286	Room Corner Test	Pass
	ASTM E84	Surface Burning Characteristics of Building Materials	Flame Spread Index: 25 or less Smoke Developed Index: 450 or less
	ASTM E108	Roof Coverings Fire Test	Pass**
	CAN/ULC S126	Fire Spread Under Roof	Pass
	CAN/ULC S138	Room Corner Test	Pass*
Air Infiltration	ASTM E1680	Air Infiltration	<0.01 cfm/ft ² @ 12 PSF***
Water Penetration	ASTM E1646	Water Penetration	No leakage at 20 PSF***
Structural	FM 4471	FM Class 1 Panel Roof	Pass. See RoofNav for rated assemblies.
	ASTM E1592	Structural Performance for Sheet Metal and Sidings Systems by Uniform Static Air Pressure Difference	See load tables
Thermal	ASTM C518	Steady-State Thermal Transmission Properties by Means of the Heat-Flow Meter Apparatus	"Nominal R-value of 7.2 [hr·ft ² ·°F/Btu] per inch at 75°F mean temperature and 8.2 [hr·ft ² ·°F/Btu] per inch at 35°F mean temperature
	ASTM C1363	Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	U-values are tested with 2", 4" and 6" thicknesses. U-values for other thicknesses are interpolated. See U-values in the table on page 1
Code Approvals	IAPMO	Various Building Codes	ER-301
	FBC	Florida Building Code	FL14700
	TDI	Texas Department of Insurance	RC-684

*Not available for 3-1/4"

**Installation into steel supports only

***Tested at flat/no roof slope



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SECTION 099100 - PAINTING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This section includes the furnishing of paint, preparation and field application, and staining as indicated on the drawings or specified herein.
- B. Related Work:
 - 1. Section 40 05 20, Plant Pipe and Fittings

1.02 QUALITY ASSURANCE

- A. Include the following on labels of each paint container:
 - 1. Manufacturer's name and stock number, type and color of paint
 - 2. Instructions for use and application and reducing, where applicable
 - 3. Label analysis

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 013300:
 - 1. Manufacturer's standard product data describing recommended uses of material, application recommendations and label analysis. Provide certification that products are recommended for the intended service.
- B. Colors:
 - 1. Submit manufacturer's standard color charts for materials proposed for use. Reference ANSI/ASME A13.1.
 - 2. The **ENGINEER** and **OWNER** will select the final colors and/or manufacturers color numbers and a schedule of color placement after award of contract for this project.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver paint and materials to the site in manufacturer's original sealed containers with labels and directions intact and legible. Remove all soiled or used rags, waste and trash from paint storage area daily, and take every precaution to avoid danger of fire.

1.05 JOB CONDITIONS

- A. Do not apply paints when surface temperature is below 50°F (10°C) unless otherwise specified. Do not paint exterior surfaces during damp, frosty or rainy weather or until surface has thoroughly dried from effects of such weather. Avoid painting surfaces

exposed to hot sun.

- B. During painting operations, take all precautions to protect floors, concrete, aluminum, glass, and other prefinished surfaces from paint spatter, spillage and other soiling. Upon completion of the work, remove all paint and varnish spots from floors, glass and other surfaces.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Each paint system shall be from a single manufacturer. The paints and paint products specified herein are manufactured by TNE MEC and ICI Devoe Coatings and are intended to establish a standard of quality. The products of other paint manufacturers may be used subject to review and approval by **ENGINEER**.
- B. All finish colors are to be selected by **OWNER**.
- C. All paint systems are to be used and applied as per manufacturer recommendations. All paint systems shall only be applied over surfaces prepared as per manufacturer recommendations. Total system dry film thickness (DFT) as per manufacturer recommendations for the application.

2.02 EXTERIOR PAINT

- A. Piping:
 - 1. General Service: Paint shall consist of one coat primer and two finish coats.
 - a. Tnemec
 - 1. 1st Coat: Tnemec – Series 141 Epoxoline
 - 2. 2nd Coat: Tnemec – Series 1029 Enduratone
 - 3. 3rd Coat: Tnemec – Series 1029 Enduratone
 - b. Sherwin Williams
 - 1. 1st Coat: Sherwin-Williams – Macropoxy 646 Epoxy
 - 2. 2nd Coat: Sherwin-Williams – Pro Industrial High Performance Epoxy
 - 3. 3rd Coat: Sherwin-Williams – Pro Industrial High Performance Epoxy
 - c. or approved equal

2.03 INTERIOR PAINT

- A. Piping:
 - 1. General Service: Paint shall consist of one coat primer and two finish coats.
 - a. Tnemec
 - 1. 1st Coat: Tnemec – Series 27 WB Typoxy

2. 2nd Coat: Tnemec – Series 1029 Enduratone
3. 3rd Coat: Tnemec – Series 1029 Enduratone
- b. Sherwin Williams
 1. 1st Coat: Sherwin-Williams – Macropoxy 646 Epoxy
 2. 2nd Coat: Sherwin-Williams – Pro Industrial High Performance Epoxy
 3. 3rd Coat: Sherwin-Williams – Pro Industrial High Performance Epoxy
- c. or approved equal

2.04 ACCEPTABLE MANUFACTURERS

- A. Specifications and products scheduled are of the following manufacturers:
 1. Tnemec, Inc.
 2. The Sherwin-Williams Company
- B. Specifications are derived from above manufacturer's standard specification numbers for a complete coating system, including primers, undercoats, finish coats, and varnishes, as applicable. Equivalent products of other first quality manufacturers will be acceptable subject to compliance with specified systems with regard to type of paint in system, spreading rate, wet or dry film thickness, and sheen.
 - a. Use only top quality materials on the project. Materials not specified but required for successful application of a specified paint or coating must be of the brand and type recommended by the approved paint manufacturer. Use materials in strict accord with manufacturer's directions, including spreading rate, number of coats and wet or dry film thickness.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Remove hardware, accessories, plates, and similar items in place but not to be painted or provide adequate protection, prior to preparing surfaces for painting. Reinstall items at completion of painting. Use only skilled mechanics for removing and connection of above items.
- B. Do not paint stainless steel, copper, fixtures, brass, bronze, pre-painted equipment, chlorinating equipment, or glass.
- C. Ferrous Metal: Remove grease, rust, scale, and dust. Touch up chipped or abraded areas on shop coated items. Where steel and iron have a coating of scale, remove by wire brushing or sand blasting to produce a satisfactory painting surface.

3.02 APPLICATION

- A. Employ only skilled mechanics to ensure the very best workmanship. Paint all surfaces scheduled, noted on drawings, or herein specified.
- B. Surfaces to be painted shall be clean, dry, smooth, and adequately protected from

damage. Spread each coat evenly and smoothly without runs, sags, drips, brush marks, thin spots, or other defects.

- C. Apply all materials under adequate illumination. Apply paint at proper consistency, not thinned or otherwise altered, except in accordance with manufacturer's printed instructions. Tint each coat slightly darker than preceding coat. Allow each coat to dry thoroughly before applying succeeding coats.
- D. Protect paint work and adjacent work at all times by suitable covering. Upon completion of work, remove all paint spots from adjacent surfaces, remove all rubbish and accumulated materials of whatever nature, and leave work in clean, orderly and acceptable condition.

END OF SECTION

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SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.
- B. U.S. Fish and Wildlife Service (USFWS) Region 7 Guidelines for Preventing the Spread of Aquatic Invasive Species.
- C. Alaska Department of Environmental Conservation Division of Spill Prevention and Response. Managing Petroleum-Contaminated Soil, Water, or Free Product during Public Utility and Right-of-Way Construction and Maintenance Projects. Technical Memorandum. September 2018
- ~~C.D.~~ D. Contaminated Materials Management Plan (CMMP)

1.02 SUMMARY

- A. Section Includes:
 - 1. Preparing subgrades for slabs-on-grade, walks, pavements, and grasses.
 - 2. Subbase course for pavements.
 - 3. Subbase course and base course for asphalt paving.
 - 4. Subsurface drainage backfill for walls and trenches.
 - 5. Excavating and backfilling trenches for utilities and pits for buried utility structures.
 - 6. Handling of contaminated soil in trenches.
- B. Related Sections:
 - 1. Division 01 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.
 - 2. Division 22 Sections for installing underground utilities.
 - 3. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
 - ~~3.4.~~ Division 31 Section "Field Screening" for field screening for contaminants during excavation.
 - ~~4.5.~~ Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

1.03 DEFINITIONS

- A. Backfill: Soil material used to fill an excavation.
- B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Material in which utility pipelines or utility-related structures are set.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Breakup: Initiation of spring thaw as defined in APDES General Permit AKR100000 for Discharges from Large and Small Construction Activities (Construction General Permit).

- F. Clean Soil: Soil not located below groundwater seasonal fluctuation level and therefore believed to be free of PFAS contamination.
- G. Contaminated Soil: ~~All soil below the upper limits of the seasonal groundwater table fluctuation are considered contaminated. Estimated upper limit is shown on project profile sheets.~~ All soils located within the Level 1 zone as shown in Figure 2 of the Contaminated Material Management Plan considered to contaminated.
- H. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as recommended by Engineer of Record and approved by Developer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without recommendation by Engineer of Record and approval by Developer. Unauthorized excavation, as well as remedial work directed by Engineer of Record, shall be without additional compensation.
- I. Fill: Soil materials used to raise existing grades.
- J. Geomembrane: Synthetic liner rated for direct burial to impede subsurface liquid transport.
- K. Geotextile: Permeable synthetic fabric for soil separation or filtration. Non-Frost Susceptible Soils: Non-frost susceptible soils are inorganic soils containing less than 3 percent by weight of grains finer than 0.02 mm. The methods of test will be ASTM C 117, C 136, D 75, and D 422.
- L. PFAS: Per- and polyfluoroalkyl substances are a group of man-made chemicals that includes perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).
- M. Pipe Zone: Interval of backfill around a buried pipe extending from the bottom of the pipe to a level of 1 foot over the top of the pipe.
- N. Spring Line: Horizontal line coincident with the centerline of a buried pipeline.
- O. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- P. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- Q. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- R. Trench Excavation: Any excavation for a pipeline or appurtenance.
- S. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without recommendation by the Engineer of Record and approval by Developer. Unauthorized excavation, as well as remedial work recommended by the Engineer of Record and approved by Developer, shall be at the Contractor's expense.

- T. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.04 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.
 - 1. American Iron and Steel (AIS)
 - 2. Build America, Buy America Act
- B. See Supplementary Conditions for details.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 - 1. Warning tapes.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Classification according to ASTM D 2487.
 - 2. Laboratory compaction curve according to ASTM D 1557.
- C. Preconstruction Submittals:
 - 1. Excavation and Trenching Plan: No less than 30 days prior to the anticipated start of excavation activities, submit for approval a detailed plan for all proposed structure excavation, trenching, bracing, and shoring activities. Excavation and trenching plan shall conform to:
 - a. Be prepared by a Professional Engineer registered in the State of Alaska.
 - b. Occupational Safety and Health Act's (OSHA) excavation standards outlined in 29 CFR Part 1926, Subpart P.
 - c. If stability of pavements, sidewalks, guardrails, and related structures is endangered by excavations then shoring or bracing designed by a qualified person shall be provided to ensure stability of structures and protect working personnel. Underpinning and undercutting shall not be allowed as part of the excavation and trenching plan.
 - d. At a minimum, the excavation and trenching plan shall include:
 - 1) Complete details and substantiating calculations, sealed by a Professional Engineer registered in the State of Alaska.
 - 2) Activity Hazard Analysis (AHA) that defines all proposed steps being performed within the excavation and trenching activities. The AHA shall identify work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel, and the control measures to be implemented.
 - 3) Complete details of all protective systems proposed. Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.
 - 4) Methods and locations for egress into work area.
 - 5) Documentation that examination of the ground provides no indication of a potential cave-in.

- 6) Rescue plan and procedure that contains provisions for self-rescue and assisted rescue of any working who is buried during a cave-in including rescue equipment.
 - 7) Diagram or sketch of work area where work is to be performed, with adjacent and nearby structures and roadways shown.
 - 8) Projected maximum depth of excavation.
 - 9) Projected soil type classification and method of testing or justification to determine soil type.
 - 10) Planned method of shoring, sloping, and/or benching.
 - 11) Planned method for confined space entry, trench access and egress, and atmospheric monitoring process (if applicable).
 - 12) Proposed methods for preventing damage or impacts to adjacent pavements, sidewalks, guardrails, and other structures designated to remain within or adjacent to the construction work area.
 - 13) Plan for management of excavated soil/asphalt/concrete.
 - 14) Plan for traffic control.
 - 15) Digging permits (Excavation permits). All underground lines/utilities (communication lines, water, fuel, electric lines) shall be located and protected from damage or displacement.
 - 16) Utility companies and other responsible authorities shall be contacted to locate and mark the locations and, if they so desire, direct or assist with protecting the underground installations.
- e. Do not mobilize excavation and trenching equipment to the site without an approved excavation and trenching plan.
- f. Submit all revisions to the approved excavation and trenching plan to the Engineer for approval. For all equipment not previously identified in the excavation and trenching plan, include in the submittal all of the information required above for the excavation and trenching plan. Explain to the Engineer, in writing, which portions of the approved excavation and trenching plan will be superseded by the revision and which portions remain unchanged. Allow at least 5 days for the Engineer's approval of excavation and trenching plan revisions.

D. Contaminated Soils Testing and Reporting

1. Post Construction Reports as defined in Section 14 of the CMMP

1.07 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.08 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from City and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by City or authorities having jurisdiction.

- B. Utility Locator Service: Notify the Alaska Dig Line for area where Project is located a minimum of 24 hours before beginning earth moving operations.
- C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 01 Section "Temporary Facilities and Controls" and Division 31 Section "Site Clearing," are in place.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Plasticity Index: 6.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, OL, CH, MH, ML, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Base Course (D-1 and E-1): Aggregate shall be crushed stone or crushed gravel, and shall consist of sound, tough, durable pebbles or rock fragments of uniform quality. All material shall be free from clay balls, vegetable matter or other deleterious matters. In addition, aggregate shall meet the following requirements:

Percent of Wear	AASHTO T 96	50 max.
Degradation Value	ATM T 313	45 min.
Percent Fracture	WAQTC FOP for AASHTO TP 61	70 min.

 - 1. Gradations shall conform to the following requirements, as determined by WAQTC FOP for AASHTO T 27/T 11:

AGGREGATE FOR BASE

<u>Sieve Designation</u>	<u>D-1 Percent Passing by Weight Grading</u>	<u>E-1 Percent Passing by Weight Grading</u>
1-inch	100	100
3/4-inch	70 - 100	70 - 100
3/8-inch	50 - 80	50 - 85
No. 4	35 - 65	35 - 65
No. 8	20 - 50	20 - 50
No. 40	6 - 30	15 - 30
No. 200	0 - 6	8 - 15

- E. Subbase: Hard, durable particles or fragments of stone or gravel containing no muck, frozen material, roots, sod, or other deleterious matter. Liquid limit not greater than 25 as tested by ATM 204. Plasticity index not greater than 6 as tested by ATM 205.

Percent of Wear	AASHTO T 96	50 max.
Degradation Value	ATM 313	40 min.

 - 1. Meet the following gradation as tested by ATM 304:

Sieve Designation	GRADING				
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
4-inch	100	-	-	-	-
2-inch	85-100	100	-	-	-
1-inch	-	-	100	-	-
3/4-inch	-	-	-	100	-
No. 4	15-60	15-60	40-75	45-80	-
No. 16	-	-	20-43	23-50	-
No. 200	Less than 10	Less than 6	4-10	4-12	0-6

- F. Selected Material, Type A: Aggregate containing no muck, frozen material, roots, sod or other deleterious matter and with a plasticity index not greater than 6 as tested by ASTM 204 and ATM 205. Meet the following gradation as tested by ATM 304:

Size	Percent Passing
No. 4	20-60
No. 200	Less than 6 (based on the 3-inch minus fraction)

- G. Bedding Course: Uniformly graded pea gravel meeting the gradation requirements in the table below if wet conditions are encountered:

Size	Percent Passing
3 inch	100
No. 4	20-60
No. 200	Less than 6 (based on the 3-inch minus fraction)

1. For dry conditions: Uniformly graded pea gravel as specified above or Pit Run gravel material meeting the requirements in the table below, containing no frozen, organic, muck, wood debris, or other deleterious material.

Size	Percent Passing
2-inch	100
No. 4	30 – 85
No. 60	35 max
No. 200	Less than 5

- H. Drainage Rock and Leach Rock: Washed, uniformly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 4-inch sieve and not more than 5 percent passing a 1-inch sieve. This material shall be free of silt and clay particles adhering to the rock.
- I. Common Fill: Subsoil materials used for fill and backfill shall be free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and deleterious or objectionable materials and shall not contain unsuitable material and frozen material. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

2.02 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
1. Blue: Water systems.
- B. Filter Fabric: Meet AASHTO M 288 for separation (Class 3). Fabric must be nonwoven and meet the following requirements: AMOCO 4547 or equal.
1. Grab Tensile Strength: Minimum 112 pounds as determined by ASTM D 4632.
 2. Puncture Strength: Minimum 40 pounds as determined by ASTM D 4833.
 3. Elongation: Minimum 50 percent as determined by ASTM D 4632.
- C. Geotextile: Geotextile shall meet AASHTO M 288 for separation (Class 2). Fabric must be nonwoven with an elongation greater than or equal to 50 percent.
1. Permittivity: Minimum of 0.05 per second as determined by ASTM D 4491.
 2. Apparent Opening Size: Equal to or between the No. 70 and No. 100 as determined by ASTM D 4751.
- D. Geogrid: Geogrid shall meet ASTM D6637. Mirafi BXG120, or equal.
- | | |
|--|---------------------------------|
| Mechanical Properties | Minimum Average Roll Value |
| 2% Strain Tensile Strength by ASTM D6637 | 410 lb/ft (MD) 620 lb/ft (CD) |
| 5% Strain Tensile Strength by ASTM D6637 | 810 lb/ft (MD) 1340 lb/ft (CD) |
| Ult. Strain Tensile Strength by ASTM D6637 | 1310 lb/ft (MD) 1970 lb/ft (CD) |
| Grid Aperture Size | 1.0 (MD) 1.3 (CMD) |
| Resistance to Installation Damage | 95% (SC), 93% (SW), 90% (GP) |
| Resistance to Long Term Degradation | 100% |
| Resistance to UV Degradation | 100% |
- E. Insulation: Extruded polystyrene board insulation, Type VII: ASTM C578, 60 psi minimum compressive strength.
1. Thermal resistance value (R-value) under heated structure:
 - a. Horizontal insulation: 1.7 hr-ft² °F/BTU
 - b. Vertical insulation: 6.7 hr-ft² °F/BTU
 - c. Corner insulation: 4.9 hr-ft² °F/BTU
 2. Thermal resistance value (R-value) under unheated structure:
 - a. Horizontal insulation: 10.9 hr-ft² °F/BTU
 3. The required R-values shown above should be divided by the R factor (R per inch) of the insulation board selected for construction to determine the thickness of insulation required in the vertical, central horizontal, and corner horizontal areas of the building to protect the foundation from frost action.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.02 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.03 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.04 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.05 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: As indicated on Drawings.
- C. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

3.06 SUBGRADE INSPECTION

- A. Notify Engineer of Record when excavations have reached required subgrade.
- B. If Engineer of Record determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 - 1. If peat or organic soils are encountered, these soils should be excavated and removed to a minimum depth of 3 feet from the pipe base.
- C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- D. Seasonally frozen soil within 2 feet of base of trench shall be allowed to thaw and base of trench shall be uniformly and systematically compacted to achieve required compaction in first lift of fill.
- E. If the soils are too wet to compact or pumping occurs, the Contractor has three options:
 - 1. Wait and allow silty soils to dry naturally.
 - 2. Till or otherwise accelerate the natural drying of the wet soils by mechanical means.

3. Excavate an additional 1 foot of subgrade, install a geosynthetic separator, and float an initial 1-foot-thick lift of structural fill on top of the separator.
- F. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer of Record, without additional compensation.

3.07 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer of Record.

3.08 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

A.B. Material excavated from areas identified as potentially contaminated in the Contaminated Materials Management Plan or determined to be contaminated by field screening shall be stockpiled following the following requirements of Section 9 of the Contaminated Materials Management Plan (CMMP).

3.09 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities.
 4. Removing trash and debris.
 5. Removing temporary shoring and bracing, and sheeting.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Coordinate backfilling with utilities testing.
- C. Clean material must be placed 18-inches above the pipe.
- D. Backfill voids with satisfactory soil while removing shoring and bracing.
- E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.11 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use structural fill soil material.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.12 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.

3.14 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Turf or Unpaved Areas: Plus or minus 0.10 foot.
 - 2. Walks: Plus or minus 0.05 foot.
 - 3. Pavements: Plus or minus 0.05 foot.

3.15 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Place base course material over subbase course under hot-mix asphalt pavement.
2. Shape subbase course and base course to required crown elevations and cross-slope grades.
3. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
4. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.16 GEOFABRIC

- A. Geotextile and Filter Fabric. Under this section, referred to commonly as “geotextile.”
 1. Storage: If stored outdoors for a prolonged period, geotextile must be elevated from the ground and covered under a tarpaulin or opaque plastic.
 - a. Contractor shall ensure rolls are adequately protected from:
 - 1) Moisture
 - 2) Ultraviolet radiation
 - 3) Chemicals such as strong acids or bases
 - 4) Temperatures in excess of 120°F
 - 5) Animal destruction
 - 6) Theft
 2. Construct the surface underlying the geotextile smooth and free of ruts, deleterious material such as sharp objects or large protruding rocks which could damage the geotextile. When placing above rip rap, flatten rip rap surface to minimize exposed particle edges and reduce the risk of tearing.
 3. Install geotextile in accordance with manufacturer’s recommendations.
 4. Hand place geotextile. No equipment shall be permitted to pull, stretch, or hold down geotextile. Place geotextile without folds or wrinkles, and avoid stretching and tearing the geotextile.
 5. Orient the geotextile with the machine (roll) direction parallel to the direction of water flow.
 6. If required, use key trenches where terminating geotextile into adjacent soil.
 7. For joining, overlap geotextile a minimum of 3 feet. Successive sheets must be overlapped upstream over downstream in a “shingle effect.”
 8. Fill. Place cover soil in accordance with this Section:
 - a. Use adequate ballast to prevent uplift by wind.
 - b. Do not leave the geotextile uncovered for more than 14 days.
 - c. Begin fill layer over geotextile at seams to maintain overlap.
 - d. Fill remaining areas with initial lift to protect geotextile.
 9. Repairs: In lieu of specific manufacturer guidelines, overlap any damaged geotextile by a minimum of 3 feet in all directions from the damage or defect. Replace geotextile that cannot be repaired.
- B. Field Quality Control: Notify Engineer for inspection of geotextile, and correct any deficiencies prior to placement of backfill.
- C. Backfill: Place fill around geomembrane to prevent stretching and tearing. Where geomembrane is positioned in the vertical plane, use temporary means to hold geotextile in position as fill is placed on either side of geotextile until completely buried.

- D. Geomembrane Repair: Clean the damaged area. Place a patch of the same type of geomembrane which extends a minimum of four inches beyond the edge of damage or defect. Thermally fuse patch to geomembrane. Replace geomembrane that cannot be repaired.
- E. Quality Control:
 - 1. In-Factory Seaming:
 - a. 100% Visual Inspection by two persons. Inspect every third seam on both sides of the geomembrane. Factory seams shall be visually inspected for full seam continuity over their full length by providing tension perpendicular to seam. Any defective areas shall be removed and repaired.
 - b. Destructive Testing. Destructive tests shall be performed per ASTM D6392.
 - 2. Field Testing. 100% Visual Inspection at each installed location. All damaged or defective areas shall be removed and repaired.
 - a. Marking: Indelibly mark all installed boots passing inspection with the date of inspection and initials of inspector at the twelve o'clock position on the boot.

3.17 GEOGRID

- A. Prepare the ground by removing stumps, boulders, etc. and fill in low spots. Unroll the geogrids directly over the ground to be stabilized. If more than one roll width is required, overlap rolls with at least 3 feet of overlap. End seams shall be staggered by a distance equal to the roll width.
- B. Place the aggregate onto previously installed geogrid.
- C. Traffic on top of the initial lift over the geogrid should travel in straight lines to prevent damage.

3.18 INSULATION

- A. Insulation shall be protected in accordance with Section 4.1.4 of the SEI/ASCE 32-01.
- B. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- C. Polystyrene insulation should not be exposed to petroleum-based products.
- D. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation.
- E. Vertical insulation placed externally on foundation walls or along edges of slab-on-grade floors should have an opaque and weather-resistant protective covering to mitigate degradation of thermal performance from ultraviolet radiation, physical damage, or other sources of deterioration.
- F. Horizontal insulation placed less than 12 inches below the ground surface, or any portion extending outward more than 24 inches from the foundation edge, should be protected against damage by concrete or asphalt pavement on the ground surface directly above the insulation by cementitious board or plywood rated for below-ground use, or by other approved materials placed directly on the top surface of the insulation.
- G. Install insulation with manufacturer's R-value label exposed after the insulation is installed.

- H. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation.

3.19 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2922, and Alaska Test Method T-11. Tests will be performed at the following locations and frequencies:
 - 1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
 - 2. Road, Parking, and Developed Areas: At subgrade and at each compacted fill and backfill lift, perform at least one field in-place density test for every 2,000 square feet or less of area, but in no case fewer than three tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.20 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer of Record; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off City's property.

~~A.B.~~ Disposal of Contaminated Soils in accordance with Section 10 of the CMMP.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Additional Excavation and Backfill: Shall be measured using the limits specified in the written authorization for the work issued on-site by the Engineer to compute the in-place cubic yardage. This is only to include additional work and material required in the case where poor soil is encountered.
- B. Gravel Road Resurfacing: Shall be measured based on the area reconstructed within in the limits of disturbance.

C. Ditch Realignment: Shall be measured based on linear foot.

~~C.~~ Contaminate Soil Stockpile will be measured based on cubic yards in stockpiled location.

4.02 BASIS OF PAYMENT

- A. Payment for earthwork bid items shall include furnishing all necessary material, personnel, equipment, transportation, and supplies to perform the work as shown and specified.

B. Payment for all other materials and work specified in this Section is subsidiary.

C. Analytical testing of stockpiled contaminated soils will be subsidiary to Contaminated Soils Stockpile pay item.

~~B.D.~~ Payment of disposal of stockpiled contaminated material will be negotiated after determination of level contamination and disposal location.

<u>Pay Item Number</u>	<u>Pay Item</u>	<u>Pay Unit</u>
312000-1	Additional Excavation & Backfill	Cubic Yard
312000-2	Gravel Road Resurfacing	Square Yard
312000-3	Ditch Realignment	Linear Foot
<u>312000-4</u>	<u>Contaminated Soil Stockpile</u>	<u>Cubic Yard</u>

END OF SECTION

SECTION 312319 – FIELD SCREENING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Contaminated Materials Management Plan.

1.02 SUMMARY

- A. Section includes field screening during construction.
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for excavating, backfilling, site grading, and controlling surface-water runoff and ponding.
 - 2. Contaminated Materials Management Plan.

1.03 DEFINITIONS

- A. ADEC: Alaska Department of Environmental Conservation

1.04 INFORMATIONAL SUBMITTALS

- A. Closeout Submittals:
 - 1. Summary Report including field screening results as well as requirements listed in Section 14 of the Contaminated Materials Management Plan. Summary Report should be submitted to the Alaska Department of Environmental Conservation (ADEC) for review and approval.

1.05 SPECIAL ENVIRONMENTAL REQUIREMENTS

- A. Comply with the requirements listed in the Contaminated Materials Management Plan.

1.06 REGULATORY NOTIFICATIONS

- A. If a previously unknown source of contamination is encountered or a new release occurs, the appropriate personnel must be notified in accordance with the procedure shown in Exhibit 12-1 of the Contaminated Materials Management Plan.

1.07 REGULATORY NOTIFICATION AND PERMITS (Not Used)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 FIELD SCREENING

- A. Field screening shall be conducted in accordance with the Contaminated Materials Management Plan.
 - 1. Locations, frequency, and methods for field screening are detailed in Section 6.1 and associated figures of the Contaminated Materials Management Plan.

3.02 SUMMARY REPORT

- A. Summary Report should be Submitted Summary Report including field screening results as well as requirements listed in Section 14 of the Contaminated Materials Management Plan. Summary Report should be submitted to the ADEC for review and approval.
- B. No adjustment for time or money will be made if resubmittals of the Summary Report are required due to deficiencies in the plan.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Field Screening: Field Screening will not be measured.

4.02 BASIS OF PAYMENT

- A. Payment for Field Screening items by the Contractor shall include furnishing all necessary material, personnel, equipment, transportation, and supplies to perform the work as shown and specified.

<u>Pay Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
312119-1	Field Screening	Lump Sum

END OF SECTION

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SECTION 331100 - WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes water-distribution piping and related components for combined water service.

1.03 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.
 - 1. American Iron and Steel (AIS)
 - 2. Build America, Buy America Act
- B. See Supplementary Conditions for details.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Training Certificate for Heat Fusion of HDPE Pipe. This shall be in accordance with ASTM F2620 and the Plastic Pipe Institute PPI TR-33. Training shall comply with the Recommended Minimum Training Guidelines for PE Pipe Butt Fusion Joining Operators for Municipal and Industrial Projects- PPI -TN-42.

1.05 DEFINITIONS

- A. Water Main: Exterior water piping that supplies water to services and fire hydrants.
- B. Water Service: Exterior domestic-water piping that connects structures to the water main.

1.06 INFORMATIONAL SUBMITTALS

- A. Field quality-control test reports.
 - 1. Hydrostatic pressure test results.
 - 2. Disinfection and biological test results.
 - 3. Joint fusion procedures and records. Copies of the data logger information and drawing showing locations shall be submitted to the inspector for review and recordation purposes before final approval of the job. Each weld/fusion on the pipe and fittings during Construction is to be labeled and marked with a contrasting permanent color marker detailing: Company name, fusion technician's initials or stamp in the bead, date of the fusion and construction project number, and joint number to correspond with the fusion data log record and picture of fusion.

1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For water valves and hydrants to include in emergency, operation, and maintenance manuals.

1.08 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with requirements of CBY water utility. Include tapping of water mains and backflow prevention.
 - 2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
 - 3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. Comply with FMG's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.
- D. NSF/ANSI Compliance: Comply with NSF/ANSI 61 for materials for water mains, service piping and specialties for domestic water.
- E. Lead-Free: All materials that come into contact with potable water shall have a low lead content, not containing more than 0.2 percent lead when used with respect to solder and flux and not have more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
 - 1. Ensure that valves are dry and internally protected against rust and corrosion.
 - 2. Protect valves against damage to threaded ends and flange faces.
 - 3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
 - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- E. Protect flanges, fittings, and specialties from moisture and dirt.

1.10 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt service to facilities occupied by the CBY or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated if the water service disruption lasts for more than 10 hours:

1.11 COORDINATION

- A. Coordinate connection to water main with CBY.

PART 2 - PRODUCTS

2.01 PE PIPE AND FITTINGS

- A. PE, Pipe: AWWA C906, DR No. 11; with PE compound of PE4710 high density polyethylene meeting ASTM D 3350 cell classification 345464C and shall be listed in the name of the pipe manufacturer in PPI (Plastic Pipe Institute) TR-4 with a standard grade HDB rating of 1600 psi at 73 degrees. Permanent identification of piping shall be provided by co-extruding multiple equally spaced color strips into the pipe outside surface or by solid colored pipe shell. Blue for potable water.
- B. PE, Fittings: Shall be butt fused unless transitioning to Ductile Iron.
 - 1. Molded Fittings shall be manufactured and tested in accordance with ASTM D 3261 and shall be marked
 - 2. Fabricated Fittings shall be made by heat fusion joining specially machined shapes out from pipe, polyethylene sheet stock or molded fittings. Fabricated fittings shall be rated for internal pressure service at least equal to the full service pressure rating of the mating pipe. Fabricated fittings shall be tested in accordance with AWWA C906.
 - 3. Polyethylene Flange Adapters. Flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion-joining machine without the use of a stub-end holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves (serration) to promote gasketless sealing, or restrain the gasket against blowout.
 - 4. Back-up Rings & Flange Bolts. Flange adapters shall be fitted with back-up rings that are pressure rated equal to or greater than the mating pipe. The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 3 or higher.
 - 5. MJ Adapter. MJ Adapter 4" through 16" may be provided with option Stainless Steel Stiffner upon request.

2.02 DUCTILE IRON PIPE

- A. Push-On-Joint, Ductile-Iron Pipe: AWWA C151, Class 50, with push-on-joint bell and plain spigot end unless flanged ends are indicated. Cement lining shall conform to AWWA C104.
 - 1. Gaskets: AWWA C111, nitrile rubber, US Pipe Field LOK 350 or equivalent.
- B. Mechanical Joint Ductile Iron Fittings: AWWA C153, ductile-iron standard pattern. The fittings shall have a minimum rating of 150 PSI working pressure but be capable of withstanding three times the rated water working pressure as per AWWA C110 and C153. Interior of fittings, cement mortar lined per AWWA C104.

1. Glands, Gaskets, and Bolts: AWWA C111, ductile-iron glands, nitrile rubber gaskets, and steel bolts.
 2. Restrained Joint: Provide field installed wedge action joint restraint for all AWWA C110 and C153 mechanical joint fittings (Meg A Lug by EBAA Iron or approved equal).
- C. For DIP through HDD casings use US Pipe TR Flex or equal.

2.03 COPPER TUBE AND FITTINGS

- A. Soft Copper Tube: ASTM B 88, Type K water tube, annealed temper.
1. Fittings: Brass flared type. Flared fittings for use with flared copper tube for cold water applications with a maximum water pressure of 175 psig, manufactured to the requirements of ANSI/ASME B16.26, "Cast Copper Alloy Fittings for Flared Copper Tubes."
- B. Hard Copper Tube: ASTM B 88, Type L, water tube, drawn temper.
1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
 2. Copper Flange Adapters: ASME B16.24 copper alloy, solder-joint × flange type, Class 150, raised-face unless otherwise indicated. Provide EPDM gaskets, NSF/ANSI 61 certified, full-face 1/8-inch thick, and Type 304 or 316 stainless steel bolts and nuts in accordance with AWWA C111.

2.04 POLYETHYLENE ENCASEMENT

- A. Encasement for Underground Ductile Iron Piping:
1. Standards: AWWA C105/A21.5.
 2. Form: Tube.
 3. Material: Linear Low Density Polyethylene (LLDPE) film of 8-mil minimum thickness.
 4. Color: Black.

2.05 GATE VALVES

- A. AWWA, Cast-Iron Gate Valves:
1. Nonrising-Stem, Resilient-Seated Gate Valves: Gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and 2-inch stem nut.
 - a. Standard: AWWA C509.
 - b. Minimum Pressure Rating: 200 psig.
 - c. End Connections: Mechanical joint.
 - d. Interior Coating: Epoxy-lined, complying with AWWA C550.
 - e. Equipped with name or symbol, size, year of manufacture, and working pressure cast into body.
- B. Bronze Gate Valves:
1. Nonrising-Stem Gate Valves: Class 125, Type 1, bronze with solid wedge, threaded ends, and malleable-iron handwheel.
 - a. Standard: MSS SP-80.

b. End Connections: Threaded or Flanged dependent on size

2.06 GATE VALVE ACCESSORIES AND SPECIALTIES

- A. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.
 - 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

2.07 SERVICE LINE CHECK VALVES

- A. AWWA Check Valves: Bronze horizontal swing-check renewable seat, Y-pattern.
 - 1. Standard: MSS SP-80.
 - 2. Pressure Rating: 175 psig.

2.08 CORPORATION VALVES

- A. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.
 - 1. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
 - 2. Corporation Stop: The corporation stop shall comply with AWWA C800 and consist of a bronze body cast to a ground-key plug valve. The corporation stop shall be designed to provide fully closed to fully open operation with one quarter turn. Corporation stops shall be manufactured by Ford Meter Corporation.
 - a. Copper water service branch tail section shall consist of a threaded female flare fitting nut which provides connection to a threaded tail and which is suitable for use with the copper service piping.

2.09 WATER SERVICE METERS

- A. Water Meters 2" and Smaller - Displacement Type:
 - 1. Manufacturer: ~~Subject to compliance with requirements by utility company, as indicated on Drawings or engineer approved alternative.~~
 - a. Badger Meter
 - a.b. Engineer Approved "or-equal"
 - 2. Source Limitations: Obtain water meters ~~—displacement type,~~ from single manufacturer.
 - 3. Standard: AWWA C700.
 - 4. Pressure Rating: 150 psig working pressure.
 - 5. Body Design: Nutating disc; totalization meter.
 - 6. Registration: Flow in **gal.** as required by utility company.
 - 7. Case: Lead-Free Bronze Alloy.
 - 8. End Connections: Threaded.
- B. Water Meters 3" and Larger- Turbine Type
 - 1. Similar to 2" with the following changes.
 - a. Body Design: Direct-Coupled Turbine with Integral Strainer and inlet/outlet straightening vanes; totalization meter.

b. End Connections: Flanged.

2.10 FIRE HYDRANTS

- A. Dry-Barrel Fire Hydrants:
1. Manufacturer: Mueller Co.
 2. Description: Mueller Super Centurion 250 with one NPS 4-1/2-inch front-facing outlet and two NPS 2-1/2-inch side outlets, 5-1/4-inch main valve, drain valve, and NPS 6 flanged-joint inlet. Include interior coating according to AWWA C550. Hydrant shall have cast or ductile iron body, compression-type valve opening against pressure and closing with pressure.
 - a. Standard: AWWA C502.
 - b. Pressure Rating: 250 psig.
 - c. Outlet Threads: NFPA 1963, with external hose thread used by local fire department. Include cast-iron caps with steel chains.
 - d. Operating and Cap Nuts: Pentagon, 1-1/2 inches point to flat.
 - e. Direction of Opening: Open hydrant valve by turning operating nut to left or counterclockwise.
 - f. Exterior Finish: Factory painted, yellow alkyd-gloss enamel paint.

2.11 BOLLARDS

- A. Schedule 40 Steel Pipe: Paint shall be yellow alkyd-gloss enamel.

2.12 BALL MARKERS

- A. Electronic Ball Marker shall contain a passive-tuned antenna, molded inside a plastic disk. Shell of marker must be impervious to minerals, chemicals, and temperature extremes. 3M Scotchmark 1403-XR Electronic Ball Marker for water utilities and 1404 XR Electronic Ball Marker for wastewater utilities, or equal, compatible with 3M marker locator.
1. Ball Marker Colors: Blue: Water systems.

2.13 RE-CIRC CHECK VALVE

- A. In-line rubber duckbill type check valve with flanged joint, NSF-61 approved. Proco Series 700 ProFlex, or equal. Rated for 125 psig.

2.14 TRACER WIRE

- A. #12 stranded copper Type UL HMWPE (High Molecular Weight Polyethylene). Daylight ends of the trace wire at each hydrant.

PART 3 - EXECUTION

3.01 EARTHWORK

- A. Refer to Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.02 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping except at fire hydrants.
- D. Underground Water-Service Piping:
 - 1. Soft copper tube, ASTM B 88, Type K copper, pressure-seal fittings; and pressure-sealed joints.
 - 2. Ductile-iron, push-on-joint pipe, mechanical-joint fittings, and ductile-iron-pipe appurtenances.
- E. Aboveground Water-Service Piping Inside Homes: Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings.
- F. Underground Main Piping: Ductile-iron, push-on-joint pipe, mechanical-joint fittings, and ductile-iron-pipe appurtenances. Or Butt-Fused HDPE.

3.03 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for underground installation. Use mechanical by flanged-end valves for installation at fire hydrants only.

3.04 PIPING INSTALLATION

- A. Water-Main Connection: Arrange with utility company for isolation of water main at connection points.
- B. Install ductile-iron, water piping according to AWWA C600 and AWWA M41.
 - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- C. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- D. Bury piping with minimum depth of cover over top as shown in Standard Drawings or as shown in Project Drawings.
- E. Install underground piping with restrained joints. At horizontal and vertical changes in direction, use mechanical fittings with restraint.

3.05 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
 - 1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
 - 2. HDPE- Joints between plain end pipes and fittings shall be made by butt fusion. External and internal beads shall not be removed from the pipe.

3.06 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
 - 1. Field-lock gaskets.
 - 2. Concrete thrust blocks.
 - 3. Set-screw mechanical retainer glands.
 - 4. Bolted flanged joints only at fire hydrants.

3.07 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. Corporation Valves/Pitorifices: Install each underground curb valve with head pointed up.

3.08 WATER METER INSTALLATION

- A. Install water meters, piping, and specialties according to manufacturer's instructions.

3.09 FIRE HYDRANT INSTALLATION

- A. General: Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints, and support in upright position.
- B. AWWA Fire Hydrants: Comply with AWWA M17.

3.10 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect water-distribution piping to the CBY's water main. Install fittings and valves shown in drawings.

3.11 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than 150 psig for two hours. Test in accordance with ANSI/AWWA C600 [for Ductile Iron Piping and ANSI/AWWA C906](#).
- C. Prepare reports of testing activities and submit to Engineer of Record.

3.12 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Division 31 Section "Earth Moving."

3.13 CLEANING AND DISINFECTING

- A. Clean and disinfect water-distribution piping as follows:
 - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
 - 2. Use purging and disinfecting procedure described in AWWA C651.
- B. Prepare reports of purging and disinfecting activities and submit to Engineer of Record.
- C. Disposal of flushing water shall be the responsibility of the Contractor. Removal of this water shall not cause damage to property or inhibit the flow of vehicular traffic in or around the work area. The Contractor is responsible for obtaining ADEC permit if required.
- D. Contractor is required to provide backflow prevention during flushing and disinfection process to protect existing water mains from becoming contaminated.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Water Main: Measurement will be along the horizontal projection of the pipe from center to center of angle points.
- B. Fire Hydrants: Hydrants shall be measured on a per each basis in place including all material and installation from water main.
- C. Gate Valves: Gate valves shall be measured on a per each basis in place.
- D. Water Services: Shall be measured on a per each basis. Estimated lengths and sizes are shown on the drawings.
- E. Pump house will not be measured since this is a lump sum item.

4.02 BASIS OF PAYMENT

- A. Payment for Water Distribution items by the Contractor shall include furnishing all necessary material, personnel, equipment, transportation, excavation, bedding, and backfill up to existing grade, and supplies to perform the work as shown and specified. Bollards shall be subsidiary to the fire hydrant pay item. Excess soil material shall be hauled from the site, and this shall be subsidiary.
- B. Payment for pipe and fittings installed and other buried assemblies or work, will not be paid until trench excavation, bedding, backfill, and all testing are finished and the work is complete in place.
- ~~C. Tracer wire shall be subsidiary to HDPE water main. Payment for Contractor Furnished Water Main will not be paid until the pipe is furnished, transported, insulated, and installed.~~
- ~~D.C.~~ Payment for water services includes service saddles, corporation stops or valves, copper tubing or ductile iron as specified in service schedule, penetrations into the building, and all appurtenances inside the building. Improvements on the property that are removed such as but not limited to walkways, planters, and fences, shall be restored subsidiary to this pay item. Seeding and driveway improvements shall be paid for under respective bid items.

E.D. Payment for piping includes subbase and base course to rebuild the road. However, asphalt, and gravel resurfacing are separate pay items.

F.E. Payment for the pump house shall include work shown on civil, structural, mechanical, electrical and control sheets.

Pay Item No.	Pay Item	Pay Unit
331100-1	6" HDPE Water Main	Linear Foot
331100-2	10" HDPE Water Main	Linear Foot
331100-3	6" Ductile Iron Water Main	Linear Foot
331100-4	10" Ductile Iron Water Main	Linear Foot
331100-5	3" Recirculation Line	Linear Foot
331100-6	Fire Hydrants	Each
331100-7	6" Gate Valves	Each
331100-8	10" Gate Valves	Each
331100-9	Water Services	Each
331100-10	Pump House	Lump Sum
<u>331100-11</u>	<u>4" Recirculation Line</u>	<u>Linear Foot</u>

END OF SECTION

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SECTION 331613 – POTABLE WATER STORAGE TANK, BOLTED STEEL CONSTRUCTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This section includes furnishing and erecting the bolted steel reservoir and necessary piping and appurtenances, per AWWA D103-19 specifications, (latest revision).

1.03 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.
 - 1. American Iron and Steel (AIS)
 - 2. Build America, Buy America
- B. See Supplementary Conditions for details.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.05 DEFINITIONS

- A. Water Tank: Exterior standalone bolted steel potable water storage tank, prefabricated and assembled onsite.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualifications of Tank Supplier:
 - 1. The Engineer's selection of a factory applied epoxy-coated bolt together tank is predicated on a thorough examination of design criteria, construction methods, and optimum coating for resistance to internal and external tank corrosion. Deviations from the specified design, construction or coating details will not be permitted.
 - 2. The bidder shall offer a new tank reservoir as supplied from a manufacturer specializing in the design, fabrication and erection of bolted water storage tanks.
 - 3. The tank shown on the contract drawings and specified herein shall be fabricated by CST Industries, One Clarion or approved equal.
 - 4. Tank design shall be stamped by a licensed engineer in the State of Alaska.
 - 5. The tank vendor's engineer is responsible for verifying that the provided foundation design is adequate to support the final tank loads and reactions. The contractor shall include in their budget an allowance for up to 15% additional concrete and reinforcing steel beyond the quantities shown in the drawings, to accommodate any modifications required based on the final tank reactions.
 - 6. Erection of the tank is to be by the tank manufacturer or approved contractor. The installer shall be fully responsible for the entire installation including tank erection, and

the ultimate water tightness of the complete installation. The tank manufacturer shall monitor and inspect work performed by the approved contractor.

7. Strict adherence to the standards of design, fabrication, erection, product, quality, and long-term performance, established in this Specification will be required by the Owner and Engineer.

B. Submittal Drawings and Specifications:

1. Construction shall be governed by the Owner's drawings and specifications showing general dimensions and construction details. Drawings shall include ~~insulation-system~~ and penetration details. There shall be no deviation from the drawings and specifications, except upon written order from the Engineer.
2. The bidder is required to furnish, for the approval of the Engineer and at no increase in contract price, five (5) sets of complete specifications and construction drawings for all work not shown in complete detail on the bidding drawings. A complete set of structural calculations shall be provided for the tank structure. The tank foundation will be designed and constructed by others.
3. When approved, two sets of such prints and submittal information will be returned to the bidder marked "APPROVED FOR CONSTRUCTION" and these drawings will then govern the work detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications and shall not guarantee detail dimensions and quantities, which remains the bidder's responsibility.

C. Field Quality-Control Test Reports:

1. Hydrostatic pressure test results.
2. Disinfection and biological test results.

1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Operational instructions for water valves and meters to include in emergency, operation, and maintenance manuals.

1.08 QUALITY ASSURANCE

- A. Steel, piping, and appurtenance materials shall bear label, stamp, or other markings of specified testing agency.
- B. NSF/ANSI Compliance: Comply with NSF/ANSI 61 for materials for water piping for domestic water.
- C. AWWA Compliance: Comply with AWWA Standard D103-19.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare prefabricated steel tank components to preclude from damage incurred during transport.
- B. Protect stored steel framing, plate, and piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- C. Protect flanges, fittings, and specialties from moisture and dirt.

1.10 COORDINATION

- A. Coordinate tank construction laydown requirements and schedule with the General Contractor responsible for construction of the Pump house Site.

1.11 TANK CAPACITY AND ELEVATION

- A. Tank working capacity shall be 500,000 U.S. gallons (nominal). See drawings for operating points as well as nominal height and diameter.
- B. Freeboard space at the top of tank shall be 6.5 feet.

1.12 TANK DESIGN REQUIREMENTS

- A. Design Standards: The materials, design, fabrication and erection of the bolted tank shall conform to:
 - 1. AWWA Standard D103-19, (latest edition).
 - 2. ANSI/NSF Standard No. 61
- B. Tank Foundation: The tank vendor's engineer is responsible for verifying that the provided foundation design is adequate to support the final tank loads and reactions. The contractor shall include in their budget an allowance for up to 15% additional concrete and reinforcing steel beyond the quantities shown in the drawings, to accommodate any modifications required based on the final tank reactions.
 - 1. Tank floor shall slope up inwardly at 0.01 ft/ft (minimum).
- C. Reservoir shall be furnished with piping and appurtenances as shown on the plans and as follows:
 - 1. Inlet pipe.
 - 2. Overflow pipe.
 - 3. Outlet pipe.
 - 4. Drain pipe.
 - 5. 30-inch square, hinged, lockable roof hatch.
 - 6. Two shell manholes with hinged covers.
 - 7. Outside ladder with ladder gate and lock, without fall protection.
 - 8. Screened roof vent.
 - 9. Level indicator.
 - 10. Identification nameplate.
 - 11. Tank mixer.
 - 12. Power appurtenances.
 - 13. Communications appurtenances.
- D. Cathodic Protection: Active system required to be designed by tank manufacturer.
- E. Corrosion Allowance: No corrosion allowance (additional plate thickness) is required on any plate steel.

- F. Structural Requirements: All tank structural components to be designed per the requirements of AWWA D103-19 and API Spec 12B.
1. Seismic Design Criteria at Tank Site:

S_s	= 1.63
S_1	= 0.76
I_e	= 1.5
Site Class	= D
 2. Roof Design Criteria:

Balanced roof snow load	= 188 pounds per square foot (PSF)
P_g	= 186
I_s	= 1.2
C_e	= 1.0
C_t	= 1.2
 3. Wind Design Criteria:
 - a. Wind Speed = 161 mph, pressures to be the maximum of ASCE 07-16 and AWWA D103-19.
 4. Foundation: Shallow frost-protected mat foundation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. All materials shall meet “Buy American” meeting Federal Acquisition Regulations (FAR).

2.02 TANK MATERIALS

- A. All tank materials shall be in accordance with all applicable standards of AWWA D103-19, Section 4.

2.03 VALVE APPLICATIONS

- A. Tank Application: Use flanged-end valves for all aboveground tank piping.

2.04 COATINGS

- A. Interior Coating System:
1. All coatings that are in contact with potable water must be certified on the current approved list of the National Sanitation Foundation to meet ANSI/NSF Standard No. 61, as well as AWWA D103-19.
 2. Coating system, including coating manufacturer brand name to be as specified in bid documents.
 3. Interior coating process shall conform to AWWA D102-17 ICS-6 and shall include:
 - a. Shop epoxy-prime.
 - b. Field spot epoxy prime.
 - c. Apply epoxy finish.

B. Exterior Coating System:

1. Exterior coating system, including coating manufacturer brand name, and average dry film thickness/mils (DFT) to be as specified in bid documents.
2. All exposed edges will be coated with primer. Underside of floor will remain uncoated.
3. Exterior coating process shall include:
 - a. Shop epoxy-prime.
 - b. Field spot epoxy prime.
 - c. Apply epoxy intermediate coating.
 - d. Apply epoxy finish coat.

2.05 TANK FABRICATION

- A. All reservoir sub-assemblies and accessories, including shell manholes, ladders, and overflow pipes, shall be fabricated in accordance with AWWA D103-19, Sec. 7 Accessories for Tanks.
- B. All exterior ladders, guard rails, brackets, hatch covers, pins and fasteners shall be steel that is hot dipped galvanized per ASTM A123/153 after fabrication.
- C. Welded steel deck assembly per AWWA D103-19.
- D. Roof construction per AWWA D103-19.

2.06 APPURTENANCES**A. Pipe Connections:**

1. Overflow piping shall be 6-inch nominal diameter Schedule 80 carbon steel coated externally.
2. Inlet and outlet connections shall conform to the sizes and locations specified on the plan sheets.
3. Provide and install all internal tank piping as flanged spool pieces that facilitate free passage through roof opening and assembly inside tank.

B. Insulation Blanket

1. Provide and install removable insulation blankets at all valves and expansion joints.
2. Provide and install removable insulation blanket covers for exterior drain and overflow piping.
3. Blankets shall be made with 4 inches of mineral-wool or fiberglass blanket insulation, sewn in grey siliconized fabric, with stainless steel lacing anchors, fabricated to be well-fitting and to close easily around equipment without air gaps or exposed surfaces. Use stainless steel tie wire for securing blankets.
 - a. Insulation shall be mineral-wool or fiberglass insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

C. Outside Tank Ladders:

1. An outside tank ladder shall be furnished and installed as shown on the Drawings.
2. Safety cage and step-off platforms shall be fabricated of galvanized steel. Ladders shall be equipped with hinged lockable entry devices.

D. Access Doors:

1. Two hinged manways shall be provided as shown on the contract drawings in accordance with AWWA D103-19.
2. The manhole opening shall be a minimum of 30 inches in diameter. The access door (shell manway) and the tank shell reinforcing shall comply with AWWA D103-19.

E. Roof Vent:

1. A properly sized vent assembly in accordance with AWWA D103-19 shall be furnished and installed above the maximum water level of sufficient capacity as shown on the drawings.
2. The overflow pipe shall not be considered to be a tank vent.
3. Provide tank vent stick-up elevation from tank roof as shown on the Drawings.
4. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including a 4 mesh (1/4-inch opening size) galvanized screen. If required by the contract drawings, a 16 mesh (1/16-inch opening size) galvanized screen will be installed to prevent the entrance of insects.

F. Roof Hatch: The manufacturer shall furnish a roof opening which shall be placed in line between the outside tank ladder and tank vent and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least 30 inches square. The opening shall have a curb, at least 4 inches high and the cover shall have a downward overlap of at least 2 inches.

1. Roof hatch shall be sized to allow tank mixer to freely pass through the opening.

G. Roof Perimeter Guardrail: Perimeter guardrail and toe board around the perimeter of the deck shall be provided and installed as shown on the Drawings.

H. Liquid Level Indicator: A liquid level indicator with stainless steel float, numbered board and high visibility target shall be provided and installed as detailed on the project drawings.

I. Identification Plate: Manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall location approximately 5 feet from the grade elevation.

- ~~1. Nameplate mounting steel shall allow 5 inches clear space from shell to accommodate insulation panels.~~

J. Electrical Appurtenances: Provide supporting struts and brackets, conduit entry boots, cable entry fittings, and other fittings, complete with corrosion resistant straps, fasteners and other hardware, as required, for supporting electrical equipment, and support and entry of electrical cable and conduit, as indicated in the plans.

1. All electrical materials and installations, installed in the tank interior, shall meet the applicable requirements of Articles 2.04 and 2.06 of this specification section.
2. Struts and brackets shall be components of a mounting system, with compatible conduit straps and other required attachments, of a common manufacturer, suitable for mounting electrical raceway and equipment.
3. Struts and brackets shall be mounted to the tank with welded studs, or with mounting flanges directly welded to the tank interior and exterior, prior to applying final interior coatings ~~and exterior insulation system.~~

4. Attach struts for support of conduit and cable, at specific locations and spacing, in accordance with Article 300 of the NEC.
 5. Supporting struts mounted to the exterior of the tank, shall extend a minimum of one-foot outside of the tank ~~insulation system~~ to stand-off and support electrical raceway and exterior mounted equipment.
 6. Apply coatings to supporting struts, brackets, conduit straps and other associated fittings and attachments, mounted in the tank interior, in accordance with applicable requirements of Article 2.04 of this specification section.
 7. Provide a cord-grip fitting, at each cable entry into top of tank, with annulus of rubber grommet sized to match outside cable diameter.
 8. Provide weathertight, weatherproof, flexible conduit entry boot fitting, for the entrance of each conduit entry through the top of the tank.
 - a. Body of entry boot fitting shall be a one-piece rubber extrusion, that includes sealing flange that mates to tank surface, and flexible boot that forms an annulus seal, or gland, around the conduit.
 - b. Entry boot shall be provided as a kit, complete with corrosion resistant metallic tank mating flange, clamp(s), and attachment hardware.
 - c. Entry boots shall be flexible, permitting angled conduit entries up to 15 degrees off of perpendicular centerline, in any direction, without leaking or subjecting the conduit or conduit seal to excessive stress.
 - d. Installed entry boot, with installed conduit, shall withstand a minimum of 6 feet of water head pressure, at maximum conduit entry angle, without leakage.
- K. All ladder mounts, nozzles, and manway flanges shall be positioned to provide adequate distance from the shell to allow for stud removal and maintenance ~~without conflict with tank insulation system.~~
- L. Personal Fall Arrest System: Provide and install a fixed ladder fall arrest anchor and self-retracting lifeline. CAI Safety Systems SRL Fall Arrest Anchor or approved equal.
- M. Tank Mixer: Provide and install tank mixer where indicated in the Drawings per manufacturer's recommendations. Tank mixer shall be PAX PMW150 or approved equal.

2.07 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect water piping to the Pump House. Install fittings and valves shown in drawings.
- C. Install pre-insulated pipe and fittings per manufacturer's specifications.

PART 3 - EXECUTION

3.01 EARTHWORK

- A. All excavation, structural fill, and structural backfill in connection with foundation preparation and construction shall be completed by others according to the requirements of the drawings and of contract documents. A finished foundation will be provided for constructing the tank, in advance of the tank manufacturer's planned starting date.
- B. All trench excavation, pipe laying, and pipe bedding and backfill shall be done according to the requirements of the drawings and specifications.

3.02 CONCRETE

- A. All concrete work for the reservoir foundation shall be provided based on Specifications in Section 033000 – Cast-in-Place Concrete.

3.03 FIELD QUALITY CONTROL

- A. Tank fabricator shall field verify the foundation elevation and the tolerances of the in-place foundation. Any deviations shall be reported to the Engineer for correction before proceeding with any work. All tank piping must be in place prior to the commencement of tank erection.

3.04 TANK ERECTION

- A. The CONTRACTOR shall furnish all labor, tools, scaffolding, and other equipment necessary to properly erect the tank complete and ready for use.
- B. Erection shall be completed in compliance with Section 10 of AWWA D103-19 for bolted steel tanks.

3.05 FIELD QUALITY CONTROL TESTING

- A. After the erection of the reservoir is completed, it shall be tested for leaks. Any leaks that are disclosed in the shell bottom, roof, manhole, or piping shall be repaired.
- B. Inspection and testing shall be in accordance with Section 11 of AWWA D103-19, (latest revision).
- C. Make available all radiographs and other testing information to the Owner's Representative during construction.
- D. After completion of the work, the Contractor shall submit a written report and certification that all work has been inspected and tested and is in accordance with all applicable provisions of AWWA D103-19, (latest revision).
- E. All costs associated with testing shall be paid by the Contractor.
- F. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks ~~or field foam insulation~~ have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
 - 1. Hydrostatic Tests: Test pipe at not less than 150 psig for two hours.
 - 2. Prepare reports of testing activities and submit to Engineer of Record.

3.06 STANDARDS

- A. The tank structure shall be disinfected at the time of testing in accordance with AWWA Standard C652-02 "Disinfection of Water Storage Facilities" using chlorination method No. 2. Disinfection shall be performed by a competent water treatment contractor.

3.07 TANK MANUFACTURER'S WARRANTY

- A. The tank manufacturer shall include a warranty on tank materials and workmanship for a specified period. As a minimum, the warranty shall provide assurance against defects in material, coatings and workmanship for a period of one (1) year.

- B. Upon completion of the 1-year warranty period provide an inspection of the tank coating. The City's preference is for a submersible camera with a video that they can observe. Provide two copies of the video; one to the City and one to the RESPEC Engineers.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF PAYMENT

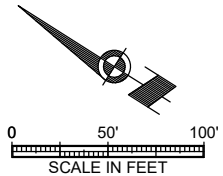
- A. Construction of the Potable Water Storage Tank and associated items by the Contractor shall include furnishing all necessary material, personnel, equipment, transportation, up to final grade, and supplies to perform the work as shown and specified.
- B. Payment for the Potable Water Storage Tank, pipe and fittings will not be paid until all testing are finished and the work is complete in place.
- C. Payment for the Potable Water Storage Tank shall include work shown on civil, structural, mechanical, and electrical sheets.

<u>Pay Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
331613-1	500K Gallon Water Storage Tank	Lump Sum

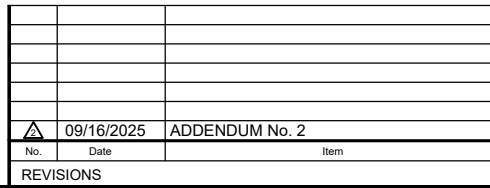
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1. GROUNDWATER DEPTHS SHOWN ON PROFILE SHEETS IS APPROXIMATE AND ELEVATIONS WERE INTERPOLATED FROM GROUND WATER MEASUREMENTS TAKEN ON 12/15/2025.



Juneau, AK
9109 Mendenhall Mall Rd, Ste. 4
Juneau, AK 99801
Phone: 907.780.6060
Fax: 907.586.3771
AECC163270

YAKUTAT, ALASKA

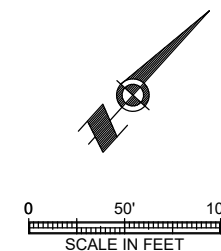
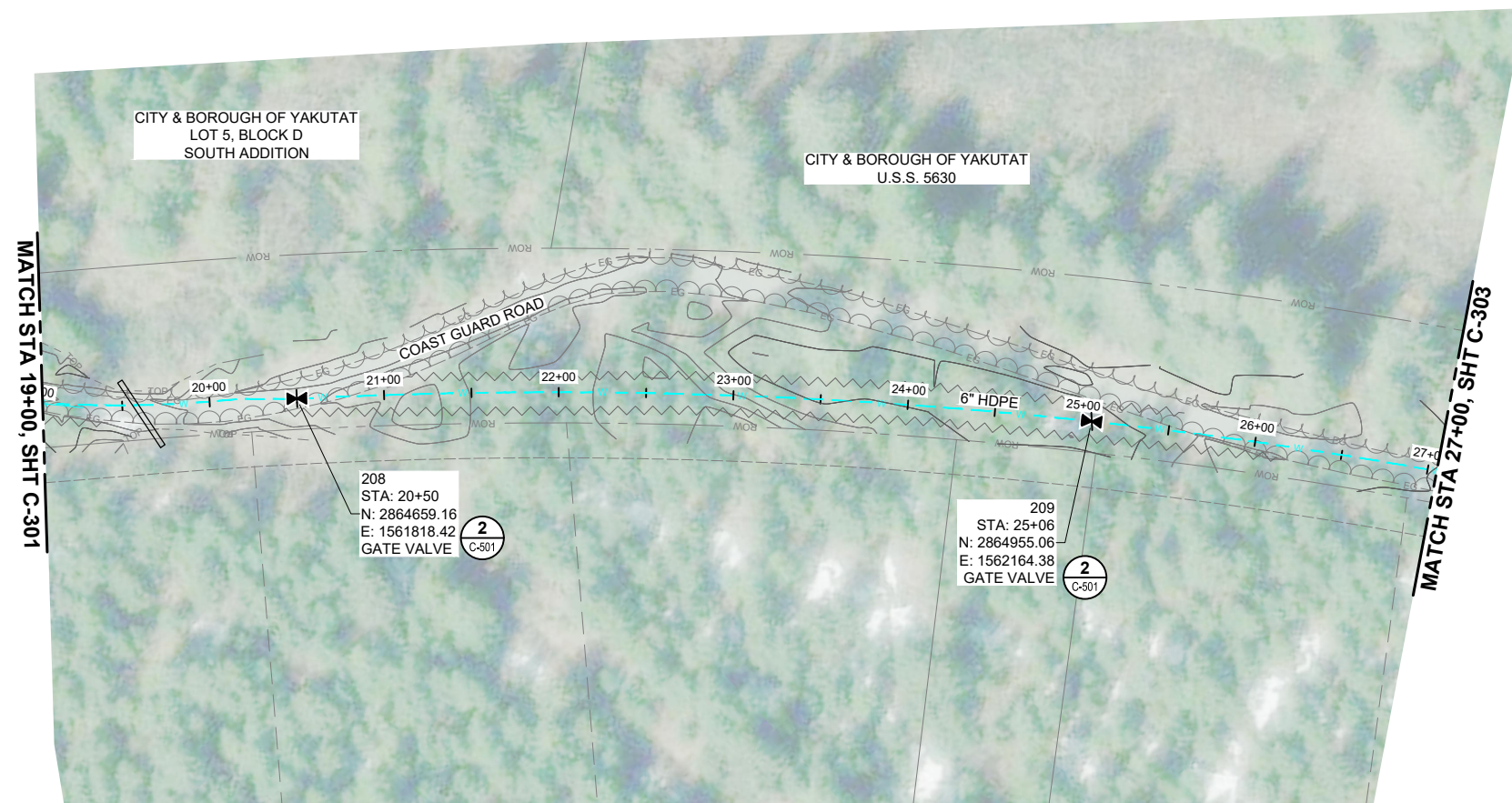
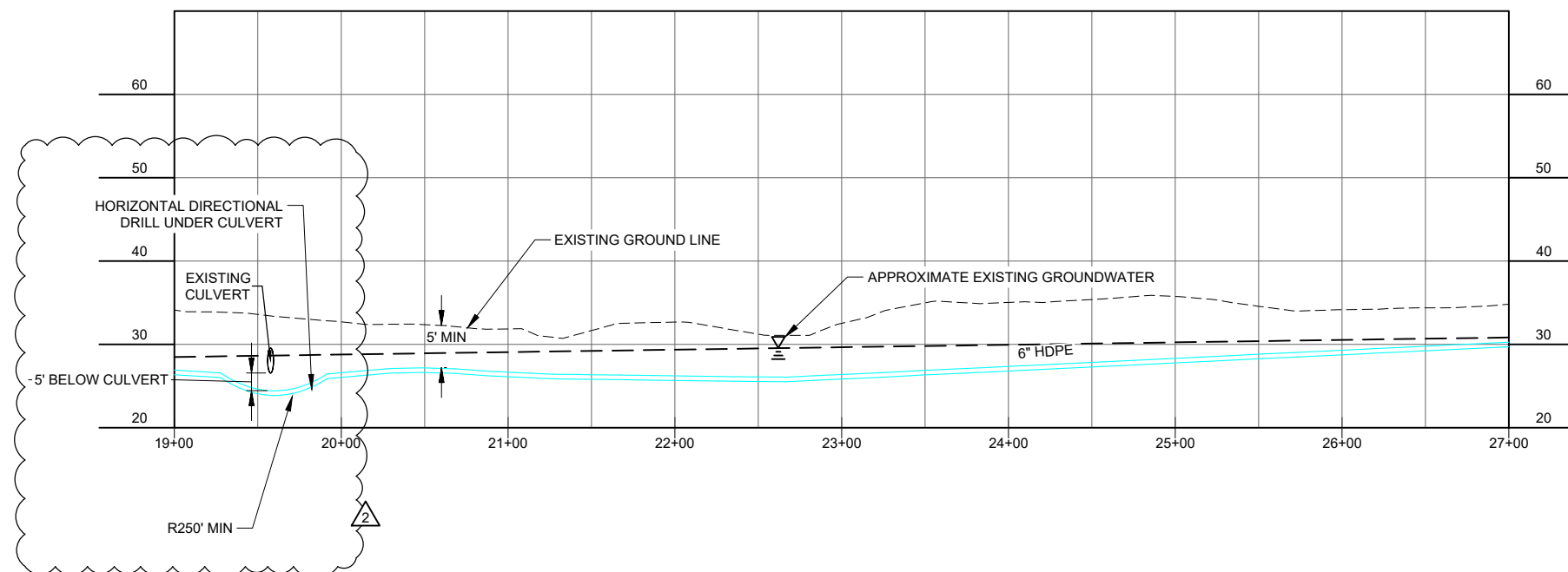
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PLAN AND PROFILE -
OPHIR CREEK ROAD

DESIGN	AM
DRAWN	HR
CHECKED	KA
DATE	04-16-202

PROJECT No.
10297.24002
SHEET NUMBER

C-301

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A	09/16/2025	ADDENDUM No. 2
No.	Date	Item

REVISIONS

DESIGN	AMN
DRAWN	HRB
CHECKED	KAB
DATE	04-16-2025

PROJECT No.	10297.24002
SHEET NUMBER	

C-302

SHEET TITLE :
PLAN AND PROFILE -
COAST GUARD ROAD (1 OF 2)

PROJECT : **CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION**

YAKUTAT, ALASKA

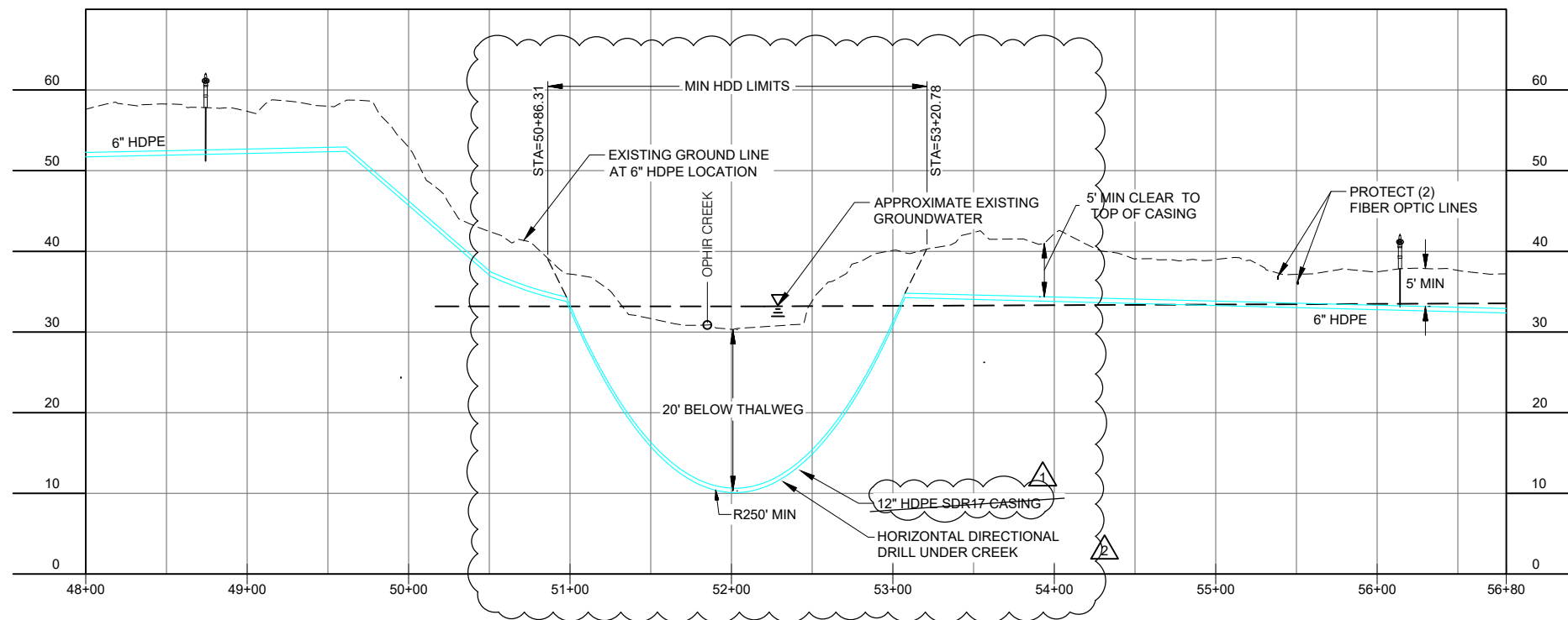
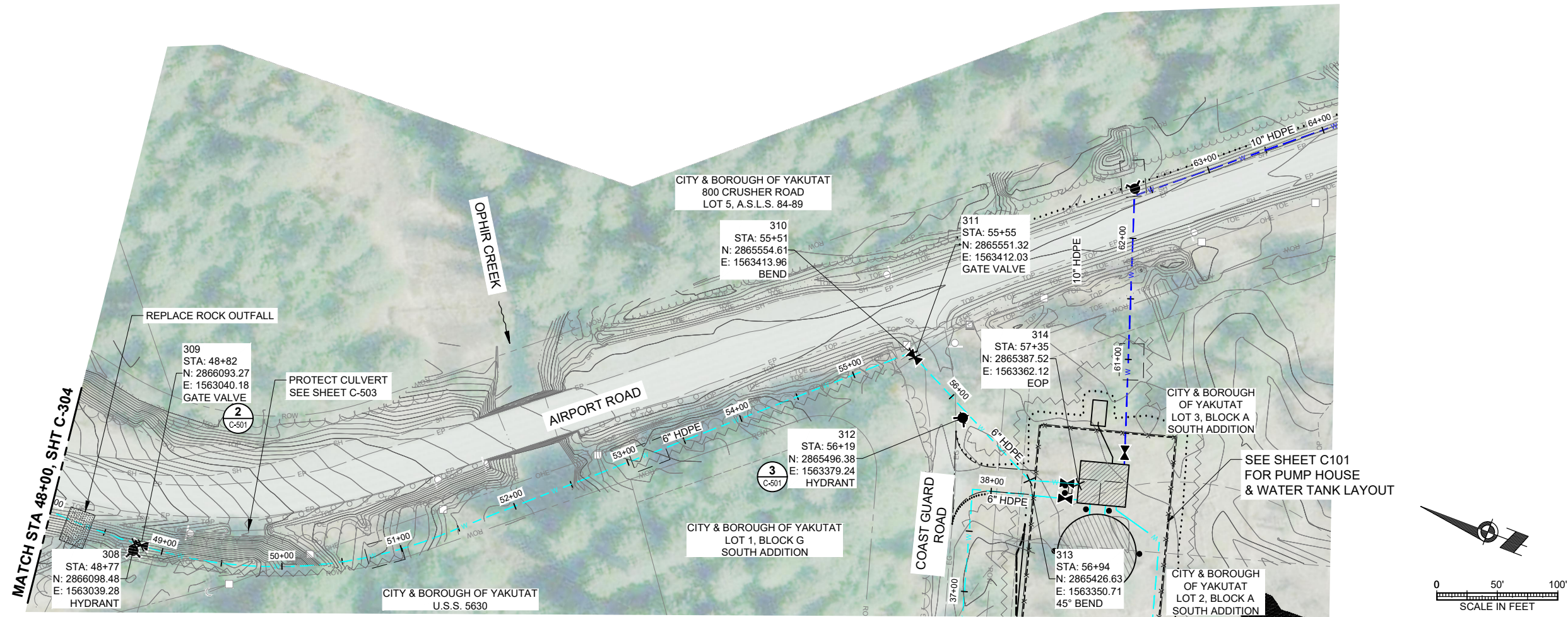
Juneau, AK
 9109 Mendota Mall Rd. Ste. 4
 Juneau, AK 99801
Phone: 907.780.6060
Fax: 907.586.3771
 AECC 163270



CONSULTANT:



IF THIS BAR DOES NOT MEASURE EXACTLY ONE INCH, THE SCALE OF THIS DRAWING HAS BEEN ALTERED DURING IT'S PRODUCTION, AFFECTING ALL LABELED SCALES



	09/16/2025	ADDENDUM No. 2
	08/27/2025	ADDENDUM No. 1
No.	Date	Item
REVISIONS		

CONSULTANT :

Juneau, AK
9109 Mendenhall Mall Rd. Ste. 4
Juneau, AK 99801
Phone: 907.780.6060
Fax: 907.586.3771
AEC 163270



PROJECT : CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION

YAKUTAT, ALASKA

SHEET TITLE :
PLAN AND
AIRPORT

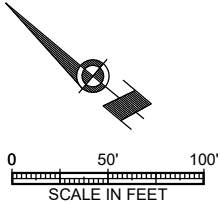
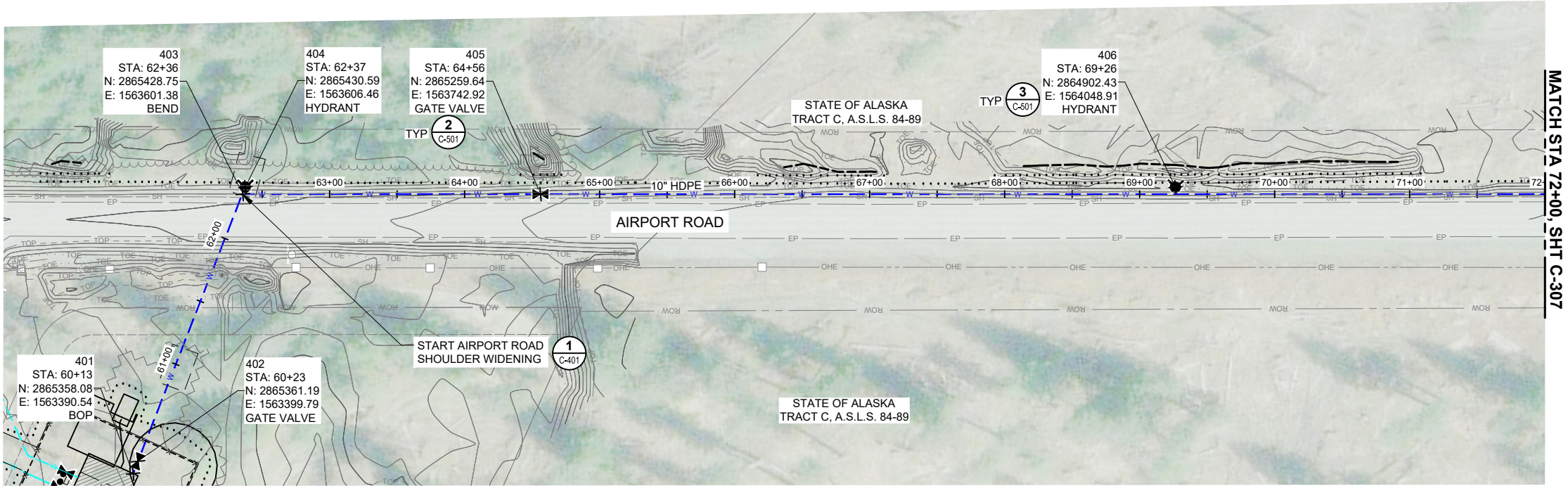
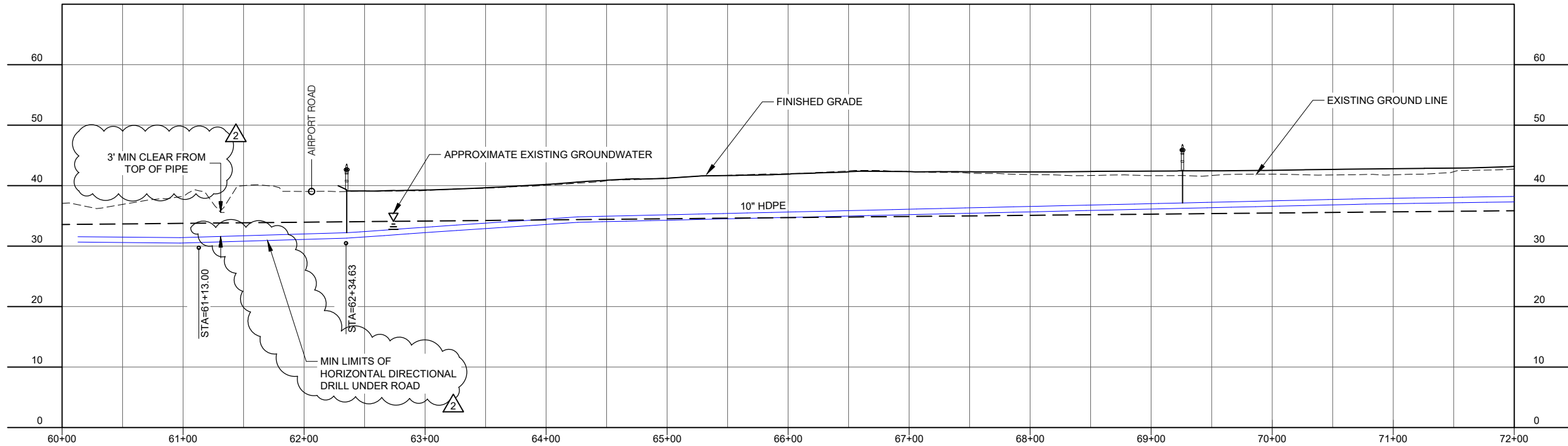
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PROJECT No.	10297.24002
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C-305

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REVISIONS		
No.	Date	Item
1	09/16/2025	ADDENDUM No. 2

CONSULTANT :

PROJECT :

**CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION**

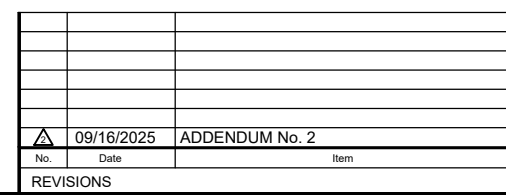
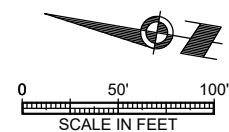
YAKUTAT, ALASKA

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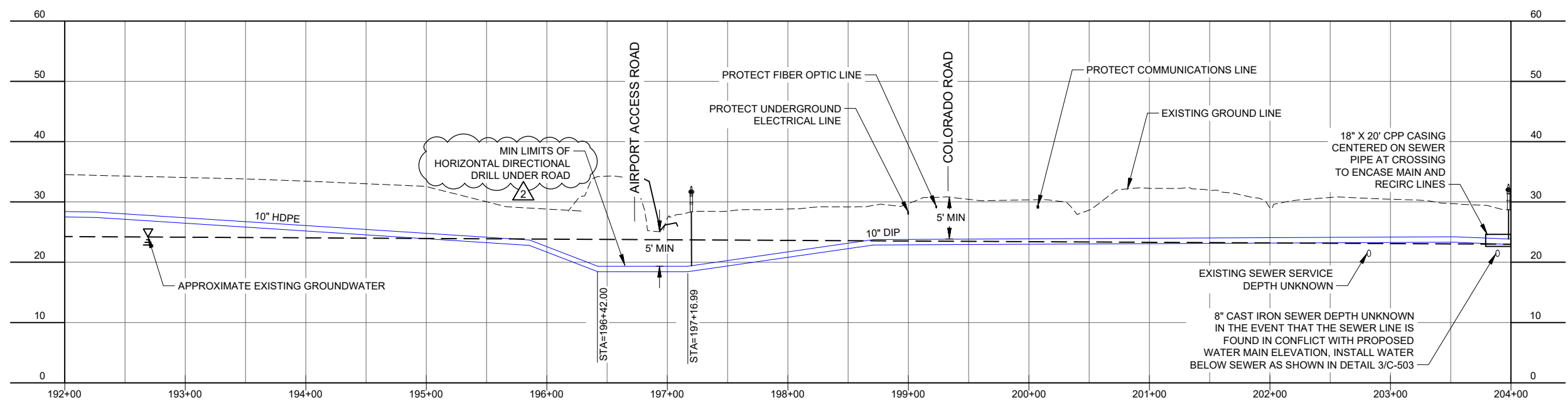
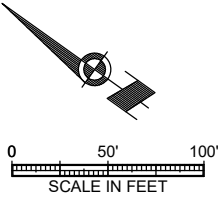
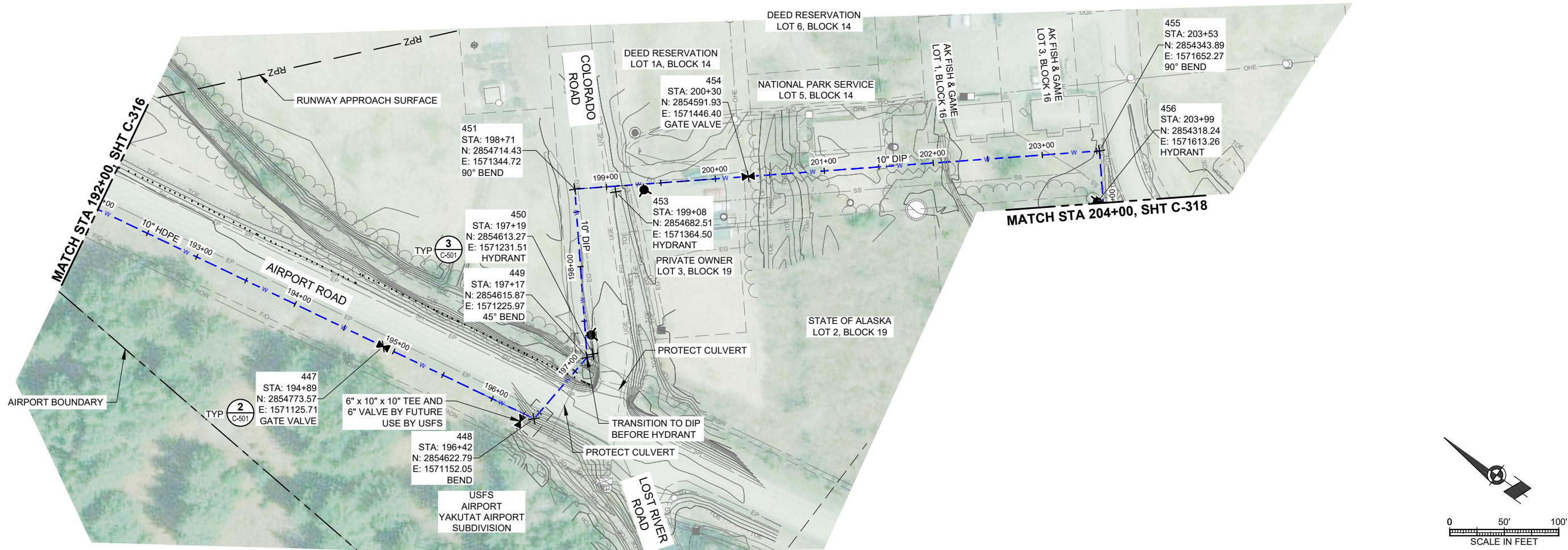
**PLAN AND PROFILE -
AIRPORT ROAD (3 OF 14)**

DESIGN	AMN
DRAWN	HRB
CHECKED	KAB
DATE	04-16-2025

PROJECT No.
10297.24002
SHEET NUMBER
C-306



C-316



No.	Date	Item
1	09/16/2025	ADDENDUM No. 2
REVISIONS		

CONSULTANT :

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ASPEC

PROJECT :

CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION

YAKUTAT, ALASKA

SHEET TITLE :

PLAN AND PROFILE -
AIRPORT ROAD (14 OF 14)

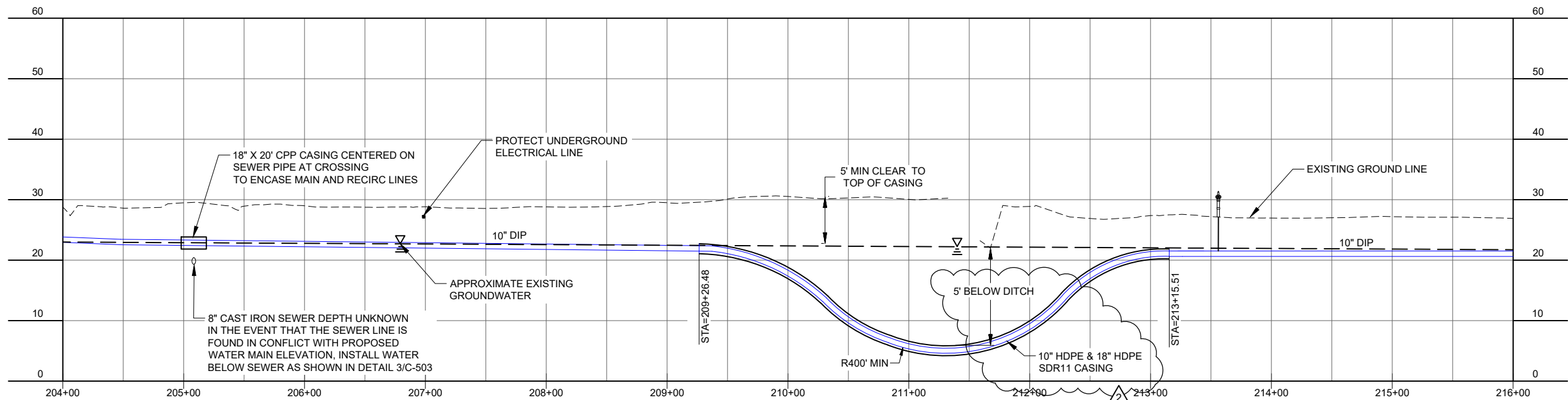
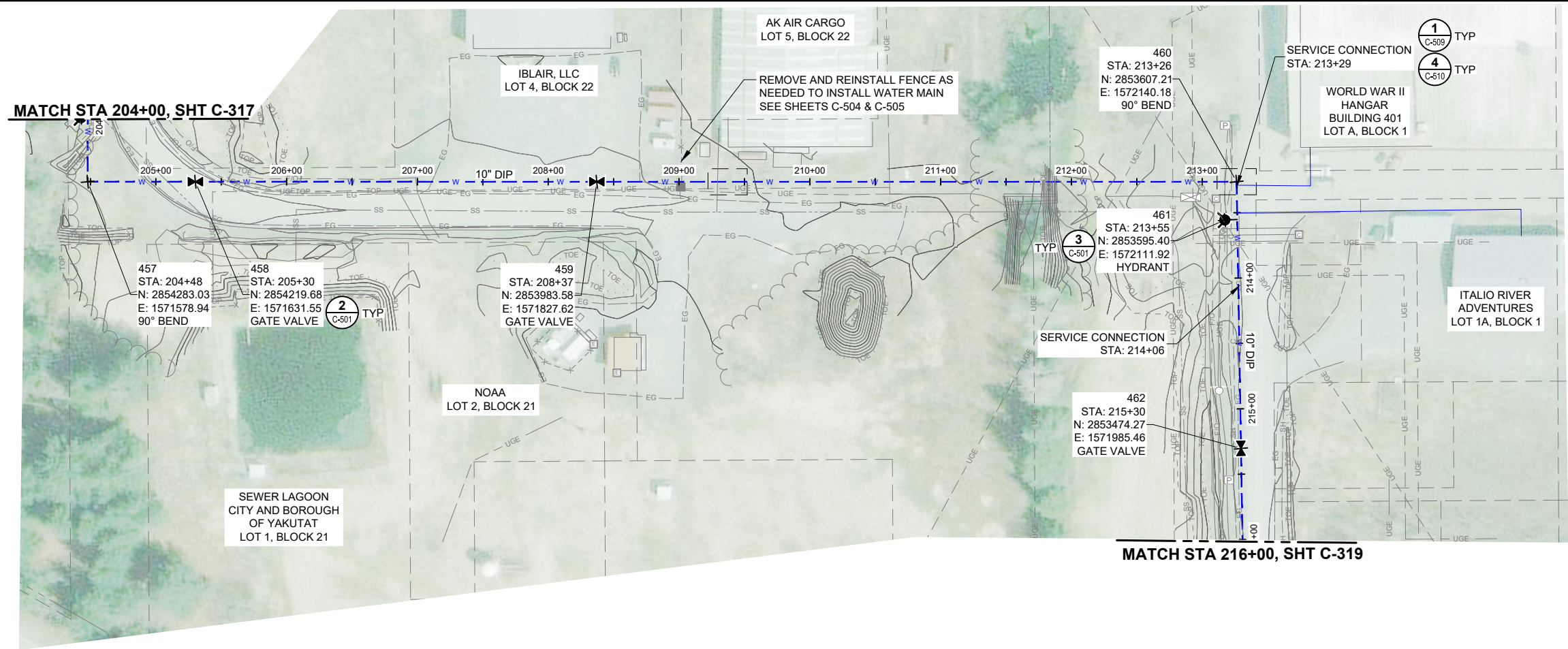
DESIGN	AMN
DRAWN	HRB
CHECKED	KAB
DATE	04-16-2025

PROJECT No.
10297.24002

SHEET NUMBER
C-317

1"

IF THIS BAR DOES NOT MEASURE EXACTLY ONE INCH, THE SCALE OF THIS DRAWING HAS BEEN ALTERED DURING IT'S PRODUCTION, AFFECTING ALL LABELED SCALES



No.	Date	Item
1	09/16/2025	ADDENDUM No. 2
REVISIONS		

CONSULTANT :

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PROJECT :

CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION

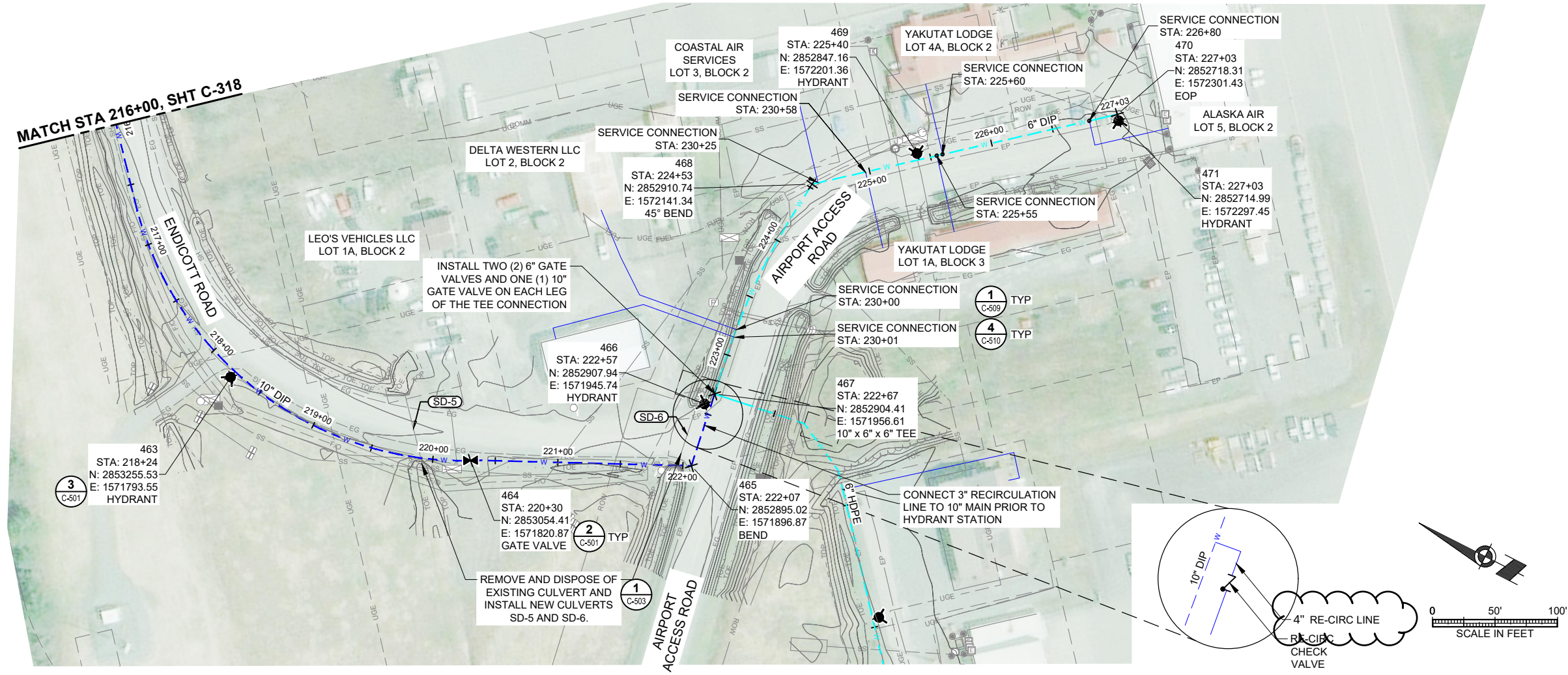
YAKUTAT, ALASKA

SHEET TITLE :

PLAN AND PROFILE -
AIRPORT AREA

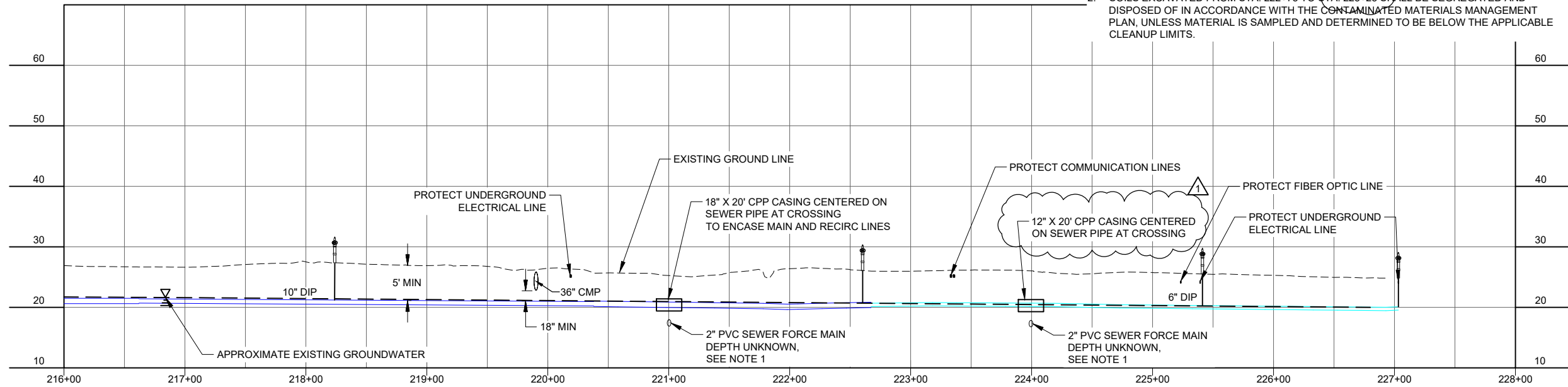
DESIGN	AMN
DRAWN	HRB
CHECKED	KAB
DATE	04-16-2025
PROJECT No. 10297.24002	
SHEET NUMBER	

C-318



NOTES:

1. IN THE EVENT THAT THE SEWER LINE IS FOUND IN CONFLICT WITH PROPOSED WATER MAIN ELEVATION, INSTALL WATER BELOW SEWER AS SHOWN IN DETAIL 3/C-503.
2. SOILS EXCAVATED FROM STA: 222+75 TO STA: 223+25 SHALL BE SEGREGATED AND DISPOSED OF IN ACCORDANCE WITH THE CONTAMINATED MATERIALS MANAGEMENT PLAN, UNLESS MATERIAL IS SAMPLED AND DETERMINED TO BE BELOW THE APPLICABLE CLEANUP LIMITS.



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PROJECT :
CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION

YAKUTAT, ALASKA

SHEET TITLE :

PLAN AND PROFILE -
ENDCOTT ROAD TO
AIRPORT ACCESS ROAD

DESIGN AMN
DRAWN HRB
CHECKED KAB
DATE 04-16-2025

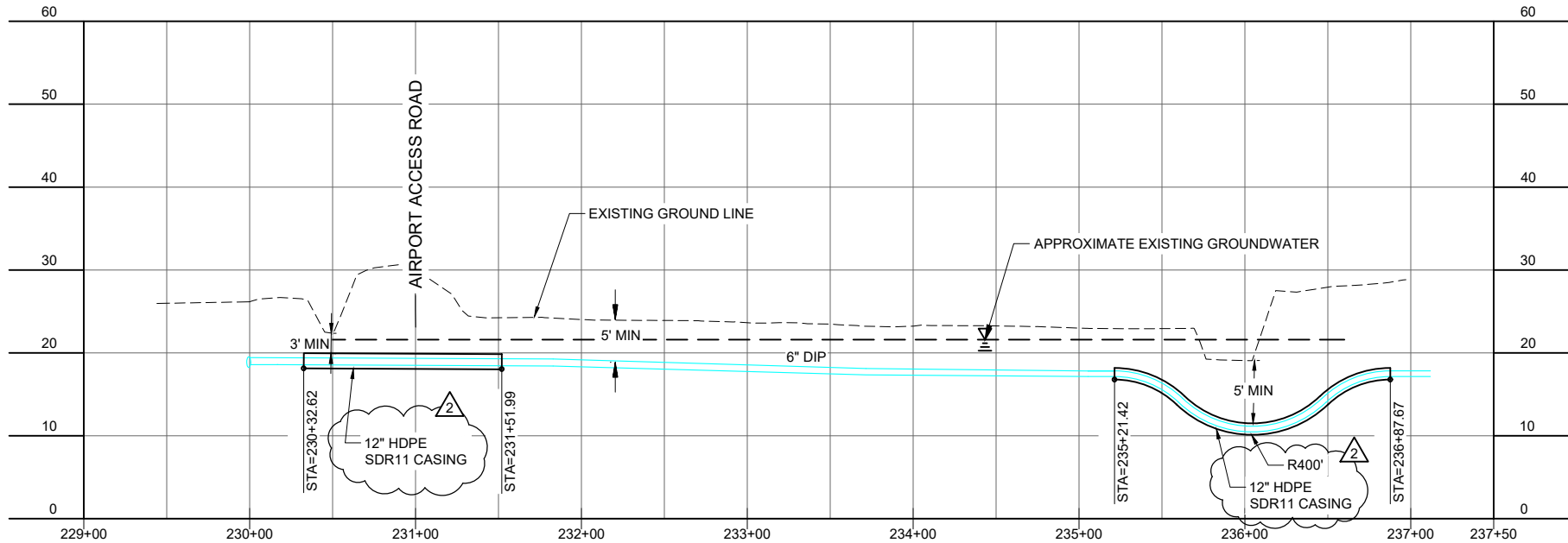
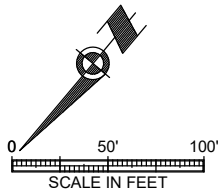
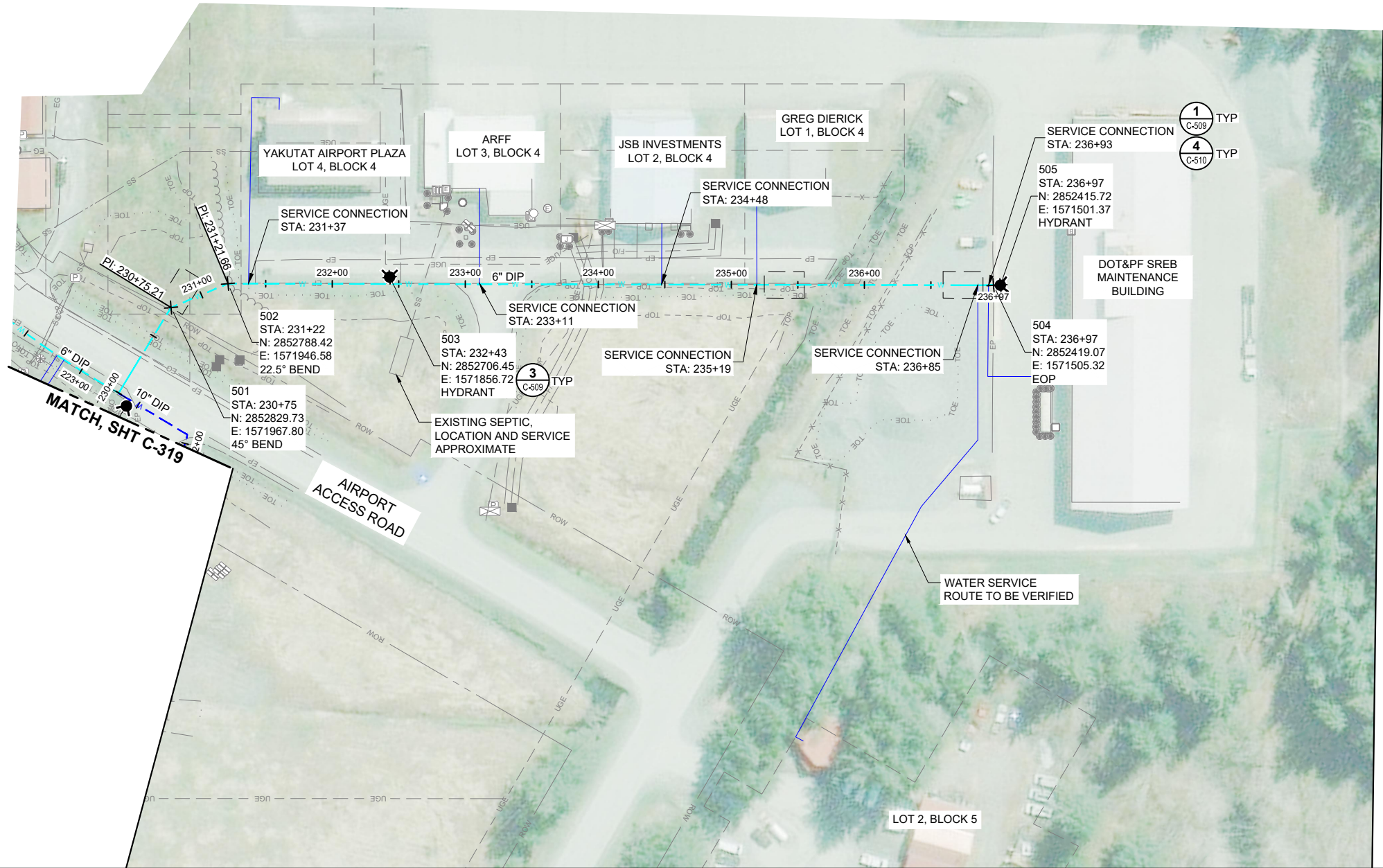
PROJECT No.
10297.24002
SHEET NUMBER

C-319

No.	Date	Item
1	09/16/2025	ADDENDUM No. 2
2	08/27/2025	ADDENDUM No. 1
REVISIONS		

1" IF THIS BAR DOES NOT MEASURE EXACTLY ONE INCH, THE SCALE OF THIS DRAWING HAS BEEN ALTERED DURING IT'S PRODUCTION, AFFECTING ALL LABELED SCALES

N:\Projects\10297_24002_C320_Airport_Wtr_Ext\ICOLD\250505m304_Original Drawing\10297_24002_C-Plan\Profile\10297_24002_C-320.dwg 09/17/2025 4:23 PM



REVISIONS	
No.	Date
1	09/16/2025
2	08/27/2025

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PROJECT :

CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION

YAKUTAT, ALASKA

SHEET TITLE :

PLAN AND PROFILE -
AIRPORT ACCESS ROAD

DESIGN AMN
DRAWN HRB
CHECKED KAB
DATE 04-16-2025

PROJECT No.
10297.24002

SHEET NUMBER
C-320



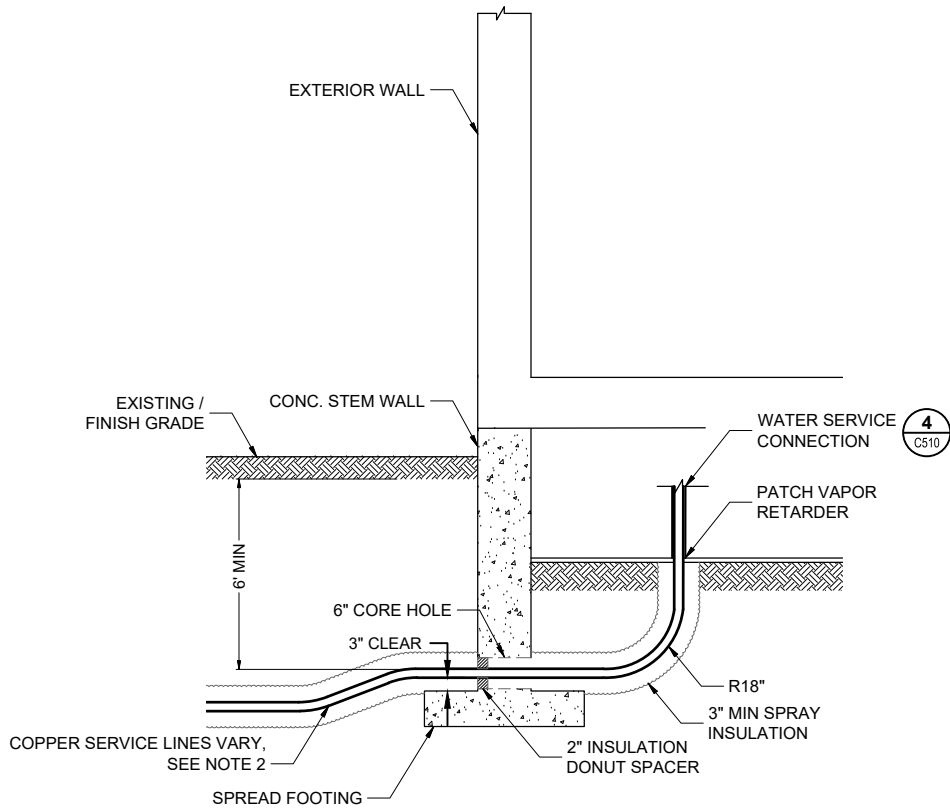
C-501 SCALE: N.T.S.



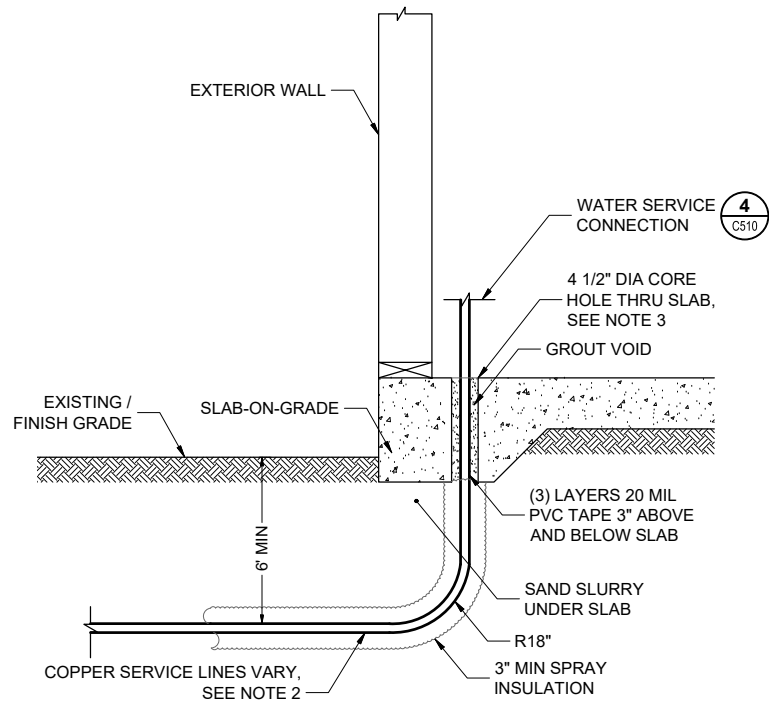
C-501

1" IF THIS BAR DOES NOT MEASURE EXACTLY ONE INCH, THE SCALE OF THIS DRAWING HAS BEEN ALTERED DURING IT'S PRODUCTION, AFFECTING ALL LABELED SCALES

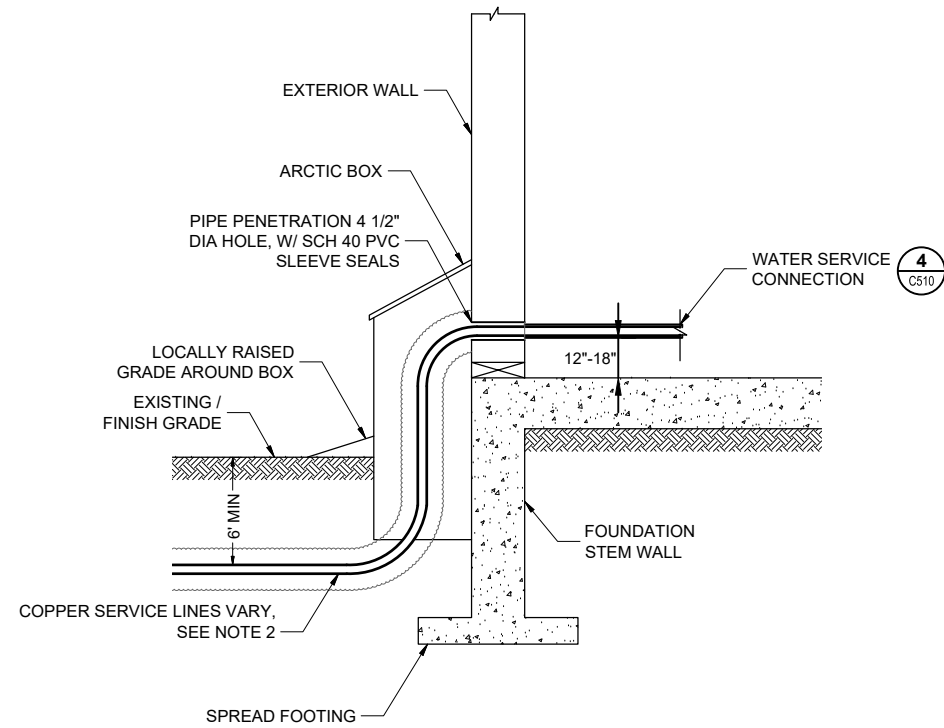
\\Project\0297_24002_CBY_Alpoet_Wtr_Ext\0297_24002_CBY_Alpoet_Wtr_Ext\0297_24002_C-DETAILS: C-510_Sep 17, 2025 4:27 PM



1 **DETAIL: SERVICE INSTALLATION - TYPE A**
C-510 SCALE: N.T.S



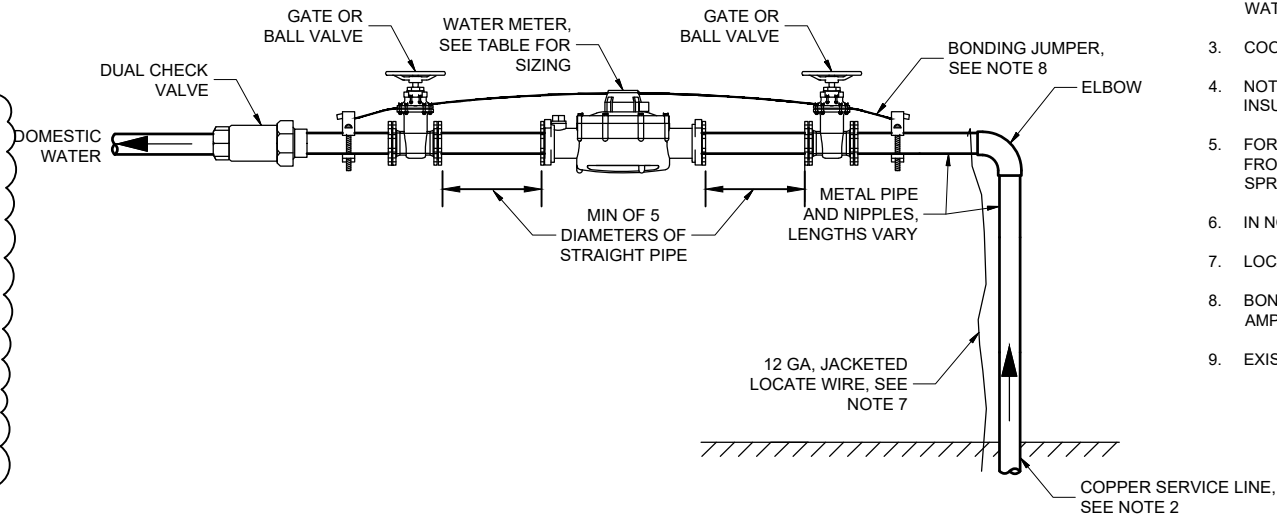
2 **DETAIL: SERVICE INSTALLATION - TYPE B**
C-510 SCALE: N.T.S



3 **DETAIL: SERVICE INSTALLATION - TYPE C**
C-510 SCALE: N.T.S

RECORDALL METER SCHEDULE			
MODEL	SIZE	OPERATING FLOW RATE	REGISTER MODEL
55	1"	1 - 55 GPM	
70	1"	1.25 - 70 GPM	
120	1-1/2"	2.5 - 120 GPM	
170	2"	2.5 - 170 GPM	
450	3"	4 - 450 GPM	

4 **DETAIL: RESIDENTAL CUSTOMER LINE WATER SERVICE CONNECTION**
C-510 SCALE: N.T.S



NOTES:

- LIMIT EXCAVATION WIDTH TO 12" WITHIN FOUNDATION FOOTPRINT.
- REFER TO WATER SERVICE SCHEDULE ON SHEET C701 FOR SPECIFIC SERVICE SIZES. SERVICE TREES MUST BE INSTALLED WITHIN CONDITIONED SPACE OF THE STRUCTURES. THE WATER SERVICE DEMARCATION POINT SHALL BE DOWNSTREAM OF THE SERVICE TREE AND DUEL CHECK VALVE, AT THE STRUCTURE'S PRIMARY DOMESTIC WATER SUPPLY POINT.
- COORDINATE PENETRATIONS WITH IN-SLAB HEAT TUBING IF PRESENT.
- NOTIFY AND ALLOW ENGINEER TIME FOR INSPECTION OF SERVICE CONNECTIONS PRIOR TO GROUTING AND INSULATION.
- FOR WATER SERVICE INSTALLATIONS WHERE LINES ARE TO BE INSTALLED ABOVE GRADE, INSULATE SERVICE LINES FROM 4 INCHES BELOW GRADE TO THE HEATED STRUCTURE THEY SERVICE WITH NO LESS THAN 8 INCHES OF SPRAYED URETHANE INSULATION.
- IN NO CASE SHALL URETHANE INSULATION BE EXPOSED TO UV LIGHT UPON FINAL INSTALLATION.
- LOCATE WIRE OPTIONAL FOR COPPER SERVICE LINES.
- BONDING JUMPER MUST MATCH ELECTRICAL COLD WATER GROUND WIRE. (EXAMPLE: NO. 4 WIRE FOR UP TO 200 AMP SERVICE.) BONDING JUMPER CLAMP MUST BE COMPATIBLE WITH COPPER PIPE.
- EXISTING WELL SUPPLY LINES SHALL BE CUT AND CAPPED PRIOR TO CONNECTING TO THE CBY WATER SYSTEM.

CONSULTANT :

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PROJECT :
CITY & BOROUGH OF YAKUTAT
WATER SYSTEM EXTENSION
YAKUTAT, ALASKA

SHEET TITLE :
WATER METER AND SERVICE
INSTALLATION DETAILS

DESIGN	AMN
DRAWN	HRB
CHECKED	KAB
DATE	04-16-2025
PROJECT No. 10297.24002	
SHEET NUMBER C-510	

REVISIONS

No.	Date	Item
1	09/16/2025	ADDENDUM No. 2

IF THIS BAR DOES NOT MEASURE EXACTLY ONE INCH, THE SCALE OF THIS DRAWING HAS BEEN ALTERED DURING IT'S PRODUCTION, AFFECTING ALL LABELED SCALES

LOT / BLOCK	PROPERTY USE	PHYSICAL ADDRESS	PROPERTY NOTES	PIPE SIZE	LENGTH OF SERVICE	REFERENCE SHEET
LOT A, BLOCK 1	COMMERCIAL	958 ENDICOTT WAY	WWII HANGER	2"	85	C-318
LOT 1A, BLOCK 1	COMMERCIAL	960 ENDICOTT WAY	ITALIO RIVER ADVENTURES	1"	237	C-318
LOT 2, BLOCK 2	COMMERCIAL	994 ENDICOTT WAY	DELTA WESTERN	1"	156	C-319
LOT 2, BLOCK 2	COMMERCIAL	996 ENDICOTT WAY	DELTA WESTERN	1"	161	C-319
LOT 3, BLOCK 2	COMMERCIAL	1020 AIRPORT ACCESS RD	COASTAL AIR SERVICES	1"	73	C-319
LOT 1A, BLOCK 3	COMMERCIAL	1023 AIRPORT ACCESS RD	YAKUTAT LODGE	1"	62	C-319
LOT 1A, BLOCK 3	COMMERCIAL	1033 AIRPORT ACCESS RD	YAKUTAT LODGE	1"	62	C-319
LOT 4A, BLOCK 2	COMMERCIAL	1034 AIRPORT ACCESS RD	YAKUTAT LODGE	1"	58	C-319
LOT 5, BLOCK 2	COMMERCIAL	1044 AIRPORT ACCESS RD	ALASKA AIR TERMINAL	1"	80	C-319
LOT 4, BLOCK 4	COMMERCIAL	951 AIRPORT ACCESS RD	YAKUTAT AIRPORT PLAZA	1"	179	C-320
LOT 4, BLOCK 4	COMMERCIAL	951 AIRPORT ACCESS RD	YAKUTAT AIRPORT PLAZA	1"	68	C-320
LOT 3, BLOCK 4	COMMERCIAL	941 AIRPORT ACCESS RD	AKDOT&PF ARFF	1"	72	C-320
LOT 2, BLOCK 4	COMMERCIAL	931 AIRPORT ACCESS RD	PARKS SERVICE HANGER	1"	46	C-320
LOT 1, BLOCK 4	COMMERCIAL	921 AIRPORT ACCESS RD	DIERICK HANGER	1"	67	C-320
	COMMERCIAL	1015 AIRPORT ACCESS RD	AKDOT&PF SREB MAINTENANCE	3"	132	C-320
LOT 2, BLOCK 5	COMMERCIAL	961 & 963 AIRPORT ACCESS RD	ECONOMY AUTO LEASING LLC	1"	386	C-320

	09/16/2025	ADDENDUM No. 2
No.	Date	Item
REVISIONS		

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PROJECT :

CITY & BOROUGH OF YAKUTAT WATER SYSTEM EXTENSION

YAKUTAT, ALASKA

SHEET TITLE:

WATER SERVICE SCHEDULE

DESIGN	AMIR
DRAWN	HRE
CHECKED	KAR
DATE	04-16-2021

PROJECT No.
10297.24002
SHEET NUMBER

C-701