FAYETTEVILLE REGIONAL AIRPORT (FAY)
Work Authorization No. 1

14-Unit T-Hangar and Taxilanes
(Construction Phase Services)
August 30, 2024

Contract for Professional Services
Dated April 1, 2022, Expires April 1, 2027

I. PROJECT DESCRIPTION

This work authorization includes the construction phase services for the 14-Unit T-Hangar and Taxilane project. The design and bidding effort were completed under work authorization No. 4. The project includes one new 14-unit T-hangar and the associated taxilanes. See Exhibit No 1.

The construction time for this project as set forth in the bid documents is 180-calendar days. An administrative NTP will be issued to allow for shop drawing review and building procurement prior to the 180-day construction time. Construction observation will be part time with a focus on critical work items. Much of the building erection will not require full-time observation. It is anticipated that the contractor will complete the punch list items within 14-days of the final inspection. Project closeout will occur after the punch list is completed and is anticipated to be completed within 60-days.

All proposed project costs are Grant eligible and are reimbursable to the City of Fayetteville (OWNER) at a ratio of 90% State/Federal and 10% Local participation. Funding is anticipated to be accomplished with legislative funds.

II. SCOPE OF SERVICES

Basic Services

The CONSULTANT will provide the general Basic and Special Services listed below and in accordance with Section I & Section II of the General Provisions of the Contract for Professional Services, dated April 1, 2022 (AGREEMENT).

1. **Project Development**: The CONSULTANT will provide the following Services:

    a. Preparation and coordination of work authorization agreement between the OWNER and the CONSULTANT to include NCDOA review and concurrence.

b. Preparation of sub-consultant contracts/coordination of services.

2. **Construction Administration**: The CONSULTANT will conduct the following Construction Administration Services:

   a. Preparation and coordination of construction contract between the OWNER and the Contractor to include verifying that all contractors and subs are and remain prequalified. Preparation and distribution of Released for Construction plans. Confirm approval of the 7460 prior to beginning construction.

   b. Review and take appropriate action with respect to shop drawings and samples, the results of tests (earth work, stone base, asphalt, & concrete) and inspections and other data which each Contractor is required to submit. Failing tests that do not comply with specification requirements will be reported to NCDOA.

   c. Review and validate Contractor's applications for payment and recommend in writing payments to Contractor in such amounts. Preparation of change orders as required. All change orders shall be approved by NCDOA and the OWNER prior to execution.

   d. Conduct a Pre-Construction Meeting. NCDOA will be invited to attend.

   e. Make weekly site visits to observe the progress of the work and conduct bi-weekly progress meetings with the Contractor and stake-holders.

   f. Conduct a Pre-Final inspection, develop Punch List and conduct a Final Inspection of the project for acceptance. The final inspection punch list will be shared with NCDOA as well as any issues discovered during the one-year warranty inspection.

3. **Project Close-Out**: The CONSULTANT will provide the following Services:

   a. Assemble, review, coordinate and submit final project documentation to NCDOA in accordance with AV-100.

Special Services

The CONSULTANT will provide the Special Services listed below and in accordance with Section II of the General Provision of the AGREEMENT.

1. **Construction Observation**: The CONSULTANT will provide the following Services:

   a. Perform technical inspection of construction by Resident Project Representative based on a 180-calendar day construction contract to observe and document construction work progress. Budget assumptions include pre-construction meeting, final inspection, full-time observation during anticipated site preparation effort (17

weeks with six 10-hour workdays per week), and part-time observation during anticipated building erection effort (8 weeks with and two 10-hour workdays per week). Actual time worked will coincide with the contractor's time spent on-site during the 180-calendar day contract.

2. **QA Materials Testing**: The CONSULTANT will provide the following Services:

   a. Oversee the services of a qualified materials testing Sub-contractor to perform quality assurance testing to ensure adherence to contract documents and specifications. Testing results will be shared/communicated with NCDOA. Quality assurance testing will be completed by ECS Southeast, LLC, as a Subconsultant to CONSULTANT. Subconsultant proposal is shown in Attachment B.

3. **Stockpile Characterization Sampling**: The CONSULTANT will provide the following Services:

   a. Oversee the services of a qualified materials testing Sub-contractor to perform stockpile characterization sampling as required by NCDOA during their review of the completed CATEX document for NEPA compliance. Sampling results will be shared/communicated with NCDOA. Stockpile characterization sampling will be completed by ECS Southeast, LLC, as a Subconsultant to CONSULTANT. Subconsultant proposal is shown in Attachment C.

DELIVERABLES

In general, deliverables will be provided in accordance with NCDOT Checklists for grant deliverables (as may be applicable) AV100 (10/2020 revision). The CONSULTANT will provide the following project deliverables to the OWNER:

1. Construction Contract Documents
2. Close out documents shall be provided in accordance with NCDOA AV-100 and AV-103.

FEE SCHEDULE

The above services shall be provided and billed according to the below Fee Schedule

Basic Services

1.	Project Development	Lump Sum	$ 13,075
2.	Construction Administration	Lump Sum	$ 90,446
3.	Project Close-out	Lump Sum	$ 11,338

Special Services

1.	Construction Observation	NTE	$191,126
2.	QA Materials Testing	At Cost	$ 19,937
3.	QA Materials Testing	At Cost	$ 25,295

The total fee of all work and expenses is in the amount of Three Hundred Fifty-One Thousand Two Hundred Seventeen dollars (**$351,217)** and is summarized in Attachment 'A'.

Miscellaneous additional work required but not contained in the above scope of services will be paid for in accordance with the current rate schedule at that time and will be subject to prior approval by the OWNER.

All other provisions of the AGREEMENT shall remain in full force and effect and unmodified other than as noted herein.

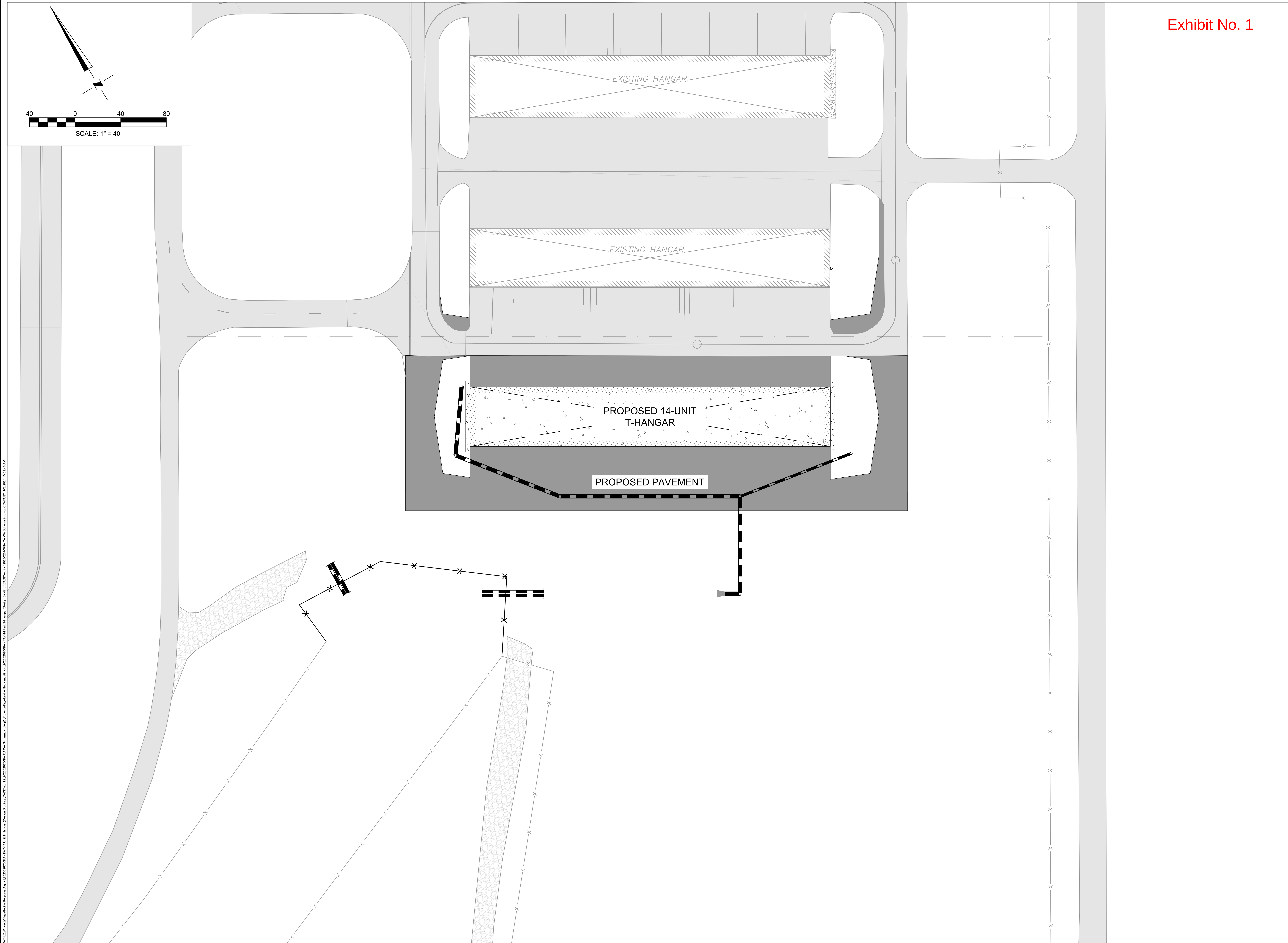
Requested By:		**Accepted By:**	
City of Fayetteville		**W.K. DICKSON & CO., INC.**	
By:		By:	
Typed Name:	Kelly Olivera	Typed Name:	Scott Sigmon
Title:	Assistant City Manager	Title:	Vice President
Date:		Date:	

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

By:	
Typed Name:	Jody Picarella
Title:	Chief Financial Officer

ATTACHMENTS:

Exhibit #1 – Work Authorization Schematic
Attachment 'A' - Manhour Summary and Direct Expenses
Attachment 'B' - Sub-consultant Proposal – QA Materials Testing (ECS)
Attachment 'C' - Sub-consultant Proposal – Stockpile Characterization Sampling (ECS)



WK DICKSON
community infrastructure consultants
1213 W. MOREHEAD ST., SUITE 300
CHARLOTTE, NC 28208
(t) (704) 334-5348
(f) (704) 334-0078
WWW.WKDICKSON.COM
NC LICENSE NO.F-0374

PROFESSIONAL SEAL

REVISION RECORD

NO.	DATE	DESCRIPTION	BY

PROJECT NAME:
14 UNIT T-HANGAR AND TAXILANES
FOR THE
CITY OF FAYETTEVILLE
FAYETTEVILLE, NORTH CAROLINA

DRAWING TITLE:
FAYETTEVILLE 14-UNIT T-HANGAR

PROJ. MGR.:	GMK
DESIGN BY:	CDC/MMH
DRAWN BY:	CDC/MMH
PROJ. DATE:	SEPT. 2024

DRAWING NUMBER:
1 OF 1

WKD PROJ. NO.:
20230287.00.RA

EXHIBIT

Attachment 'A'

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)					DATE PREPARED: 8/30/2024						AVIATION NUMBER:					
PREPARED BY: GMK					TIP NUMBER:						WBS NUMBER:					
		Employee Classifications														
TASK NUMBER	PHASE AND TASK DESCRIPTION	Principal	Sr. Project Manager	Project Manager	Project Engineer	Sr. Civil Designer	Civil Designer	Const. Observer					Admin. Manager	SUB-TOTAL
	Special Services													
	Project Development													
a.	Project Scoping, Contract Development	2.00	6.00	16.00									4.00	28.00
b.	Sub-Consultant Agreement/Service Coordination		4.00	24.00									6.00	34.00
														0.00
														0.00
														0.00
														0.00
	TOTAL HOURS/CATEGORY:	2.00	10.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	62.00
	RATES PER HOUR:	$101.90	$75.34	$71.26	$59.73	$50.51	$45.85	$45.13					$35.14	
	PAYROLL BURDEN:	$203.80	$753.40	$2,850.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$351.40	

TOTAL WORK HOURS:	62.00	
TOTAL PAYROLL BURDEN:	$4,159.00	
GENERAL OVERHEAD @ 182.83 %:	$7,603.90	
SUBTOTAL:	$11,762.90	
COMPARATIVE FEE @ 11%:	$1,293.92	
Cost of Capital @ 0.44 %	$18.30	
TOTAL:	$13,075.12	
DIRECT EXPENSES:	$0.00	From Expenses Tab
PRIME GRAND TOTAL:	$13,075.12	
Sub Consultant TOTAL:	$0.00	
GRAND TOTAL:	**$13,075.12**	

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)	DATE PREPARED: 8/30/2024	AVIATION NUMBER:
PREPARED BY: GMK	TIP NUMBER:	WBS NUMBER:

TASK NUMBER	PHASE AND TASK DESCRIPTION	Employee Classifications												SUB-TOTAL
		Principal	Sr. Project Manager	Project Manager	Project Engineer	Sr. Civil Designer	Civil Designer	Const. Observer					Admin. Manager	
	Basic Services													
	Construction Administration (180 calendar day const. Contract)													
a.	Construction Contract Development	2.00	2.00	6.00									6.00	16.00
b.	Project Documentation-Submittal Review, Test Results			24.00									2.00	26.00
c.	Project Documentation- Pay Applications, Change Orders			48.00									4.00	52.00
d.	Pre-Construction Conference			8.00										8.00
e.	Bi-weekly Progress Meetings/Weekly Site Visits/Project Coordination			260.00									12.00	272.00
f.	Pre-Final & Final Inspeciton			16.00									4.00	20.00
	TOTAL HOURS/CATEGORY:	2.00	2.00	362.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.00	394.00
	RATES PER HOUR:	$101.90	$75.34	$71.26	$59.73	$50.51	$45.85	$45.13					$35.14	
	PAYROLL BURDEN:	$203.80	$150.68	$25,796.12	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$983.92	

TOTAL WORK HOURS:	394.00	
TOTAL PAYROLL BURDEN:	$27,134.52	
GENERAL OVERHEAD @ 182.83 %:	$49,610.04	
SUBTOTAL:	$76,744.56	
COMPARATIVE FEE @ 11%:	$8,441.90	
Cost of Capital @ 0.44 %	$119.39	
TOTAL:	$85,305.86	
DIRECT EXPENSES:	$5,140.24	From Expenses Tab
PRIME GRAND TOTAL:	$90,446.10	
Sub Consultant TOTAL:	$0.00	
GRAND TOTAL:	**$90,446.10**	

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)															
PREPARED BY: GMK															
		Employee Classifications													
TASK NUMBER	PHASE AND TASK DESCRIPTION	Principal	Sr. Project Manager	Project Manager	Project Engineer	Sr. Civil Designer	Civil Designer	Const. Observer					Admin. Manager	SUB-TOTAL
	Basic Services													
	Project Close-Out													
1	Prepare and Submit Project Close-Out Documentation		6.00	32.00			16.00						4.00	58.00
														0.00
														0.00
														0.00
														0.00
														0.00
	TOTAL HOURS/CATEGORY:	0.00	6.00	32.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00	4.00	58.00
	RATES PER HOUR:	$101.90	$75.34	$71.26	$59.73	$50.51	$45.85	$45.13					$35.14	
	PAYROLL BURDEN:	$0.00	$452.04	$2,280.32	$0.00	$0.00	$733.60	$0.00	$0.00	$0.00	$0.00	$0.00	$140.56	

TOTAL WORK HOURS:	58.00	
TOTAL PAYROLL BURDEN:	$3,606.52	
GENERAL OVERHEAD @ 182.83 %:	$6,593.80	
SUBTOTAL:	$10,200.32	
COMPARATIVE FEE @ 11%:	$1,122.04	
Cost of Capital @ 0.44 %	$15.87	
TOTAL:	$11,338.22	
DIRECT EXPENSES:		From Expenses Tab
PRIME GRAND TOTAL:	$11,338.22	
Sub Consultant TOTAL:	$0.00	
GRAND TOTAL:	**$11,338.22**	

DATE PREPARED: 8/30/2024		**AVIATION NUMBER:**
TIP NUMBER:		**WBS NUMBER:**

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)															
PREPARED BY: GMK															
		Employee Classifications													
TASK NUMBER	PHASE AND TASK DESCRIPTION	Principal	Sr. Project Manager	Project Manager	Project Engineer	Sr. Civil Designer	Civil Designer	Const. Observer					Admin. Manager	SUB-TOTAL
	Special Services													
	Construction Observation (180 calendar day Constr. Contract)													
1	Full-Time RPR (10 hr/days, six days a week for 17 weeks)							1020.00						1020.00
2	Part-Time RPR (10 hr/days, two days a week for 8 weeks)							160.00						160.00
2	Pre-Construction Meeting							8.00						8.00
3	Final Inspection							8.00						8.00
														0.00
														0.00
	TOTAL HOURS/CATEGORY:	0.00	0.00	0.00	0.00	0.00	0.00	1196.00	0.00	0.00	0.00	0.00	0.00	1196.00
	RATES PER HOUR:	$101.90	$75.34	$71.26	$59.73	$50.51	$45.85	$45.13					$35.14	
	PAYROLL BURDEN:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$53,975.48	$0.00	$0.00	$0.00	$0.00	$0.00	

TOTAL WORK HOURS:	1196.00	
TOTAL PAYROLL BURDEN:	$53,975.48	
GENERAL OVERHEAD @ 182.83 %:	$98,683.37	
SUBTOTAL:	$152,658.85	
COMPARATIVE FEE @ 11%:	$16,792.47	
Cost of Capital @ 0.44 %	$237.49	
TOTAL:	$169,688.82	
DIRECT EXPENSES:	$21,437.66	From Expenses Tab
PRIME GRAND TOTAL:	$191,126.48	
Sub Consultant TOTAL:	$0.00	
GRAND TOTAL:	**$191,126.48**	

DATE PREPARED: 8/30/2024		**AVIATION NUMBER:**
TIP NUMBER:		**WBS NUMBER:**

DIRECT EXPENSES, Construction Administration

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)

PREPARED BY: GMK | AVIATION NUMBER:

TIP NUMBER: | WBS NUMBER:

DATE PREPARED: 8/30/2024 | REVIEWED BY UNIT HEAD ON:

GENERAL PROJECT WORK:	ITEM	QTY	DESCRIPTION		UNIT COST	
	Travel:					
	Sedan (Engineer)	28	Trip(s) @	274 miles @	$0.670	$5,140.24
	Sedan (Construction Observer)		Trip(s) @	miles @	$0.670	$0.00
	Carry All		Trip(s) @	miles @	$0.695	$0.00
	Carry All		Trip(s) @	miles @	$0.695	$0.00
	Car Rental			days @	$50.00	$0.00
	Gas for Rental			miles @	$0.20	$0.00
	Per Diem:		Breakfast		$10.10	$0.00
			Lunch		$13.30	$0.00
			Dinner		$23.10	$0.00
			Lodging (on lump sum Incl. taxes)		$89.10	$0.00
	Reproduction:		8 1/2 x 11 Xerox Copies @		$0.09	$0.00
			11 x 17 Xerox Copies @		$0.15	$0.00
			Blueprints - 8 1/2 x 11 @		$0.35	$0.00
			Blueprints - 42 x 72 @		$1.30	$0.00
			Bond - 8 1/2 x 11 @		$0.42	$0.00
			Bond - 34" x 68" @		$3.50	$0.00
			Vellum		$3.00	$0.00
			Stick-Ons		$1.00	$0.00
			Cover(s) @		$0.50	$0.00
			Binder(s) @		$0.50	$0.00
			Mylar - 8 1/2 x 11 @		$5.90	$0.00
			Mylar - 3' x 4' @		$21.00	$0.00
	Film and Developing:		Roll(s) @		$20.00	$0.00
				Subtotal		$5,140.24

MAPS AND DOCUMENTS:	ITEM	QTY	DESCRIPTION		UNIT COST	
	County Tax Maps:	0	Map(s) @		$7.00	$0.00
	USGS Maps:	0	Map(s) @		$7.00	$0.00
				Subtotal		$0.00

Miscellaneous Other	Item	Amount	Description		Cost Per	
						$0.00
						$0.00
						$0.00
						$0.00
						$0.00
						$0.00
				Subtotal		$0.00
				TOTAL		**$5,140.24**

*** Sum of all plots**

DIRECT EXPENSES, Construction Observation

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)

PREPARED BY: GMK | AVIATION NUMBER:

TIP NUMBER: | WBS NUMBER:

DATE PREPARED: 8/30/2024 | REVIEWED BY UNIT HEAD ON:

GENERAL PROJECT WORK:	ITEM	QTY	DESCRIPTION			UNIT COST	
	Travel:						
	Sedan (Engineer)		Trip(s) @		miles @	$0.670	$0.00
	Sedan (Construction Observer)	35	Trip(s) @	274	miles @	$0.670	$6,425.30
	Carry All		Trip(s) @		miles @	$0.695	$0.00
	Carry All		Trip(s) @		miles @	$0.695	$0.00
	Car Rental				days @	$50.00	$0.00
	Gas for Rental				miles @	$0.20	$0.00
	Per Diem:	102	Breakfast			$10.10	$1,030.20
		102	Lunch			$13.30	$1,356.60
		102	Dinner			$23.10	$2,356.20
		102	Lodging (on lump sum Incl. taxes)			$100.68	$10,269.36
	Reproduction:		8 1/2 x 11 Xerox Copies @			$0.09	$0.00
			11 x 17 Xerox Copies @			$0.15	$0.00
			Blueprints - 8 1/2 x 11 @			$0.35	$0.00
			Blueprints - 42 x 72 @			$1.30	$0.00
			Bond - 8 1/2 x 11 @			$0.42	$0.00
			Bond - 34" x 68" @			$3.50	$0.00
			Vellum			$3.00	$0.00
			Stick-Ons			$1.00	$0.00
			Cover(s) @			$0.50	$0.00
			Binder(s) @			$0.50	$0.00
			Mylar - 8 1/2 x 11 @			$5.90	$0.00
			Mylar - 3' x 4' @			$21.00	$0.00
	Film and Developing:		Roll(s) @			$20.00	$0.00
					Subtotal		$21,437.66

MAPS AND DOCUMENTS:	ITEM	QTY	DESCRIPTION		UNIT COST	
	County Tax Maps:	0	Map(s) @		$7.00	$0.00
	USGS Maps:	0	Map(s) @		$7.00	$0.00
				Subtotal		$0.00

Miscellaneous Other	Item	Amount	Description		Cost Per	
						$0.00
						$0.00
						$0.00
						$0.00
						$0.00
				Subtotal		$0.00
				TOTAL		**$21,437.66**

*** Sum of all plots**

DIRECT EXPENSES, QA Testing, Stockpile Characterization Sampling

PROJECT TITLE: (FAY), 14-Unit T-Hangar & Taxilane (Construction Phase Servies)							
PREPARED BY: GMK					AVIATION NUMBER:		
TIP NUMBER:					WBS NUMBER:		
DATE PREPARED: 8/30/2024					REVIEWED BY UNIT HEAD ON:		
GENERAL PROJECT WORK:	ITEM	QTY	DESCRIPTION			UNIT COST	
	Travel:						
	Sedan (Engineer)		Trip(s) @		miles @	$0.575	$0.00
	Sedan (Construction Observer)		Trip(s) @		miles @	$0.575	$0.00
	Carry All		Trip(s) @		miles @	$0.595	$0.00
	Carry All		Trip(s) @		miles @	$0.595	$0.00
	Car Rental				days @	$45.00	$0.00
	Gas for Rental				miles @	$0.20	$0.00
	Per Diem:		Breakfast			$8.60	$0.00
			Lunch			$11.30	$0.00
			Dinner			$19.50	$0.00
			Lodging (on lump sum Incl. taxes)			$84.11	$0.00
	Reproduction:		8 1/2 x 11 Xerox Copies @			$0.04	$0.00
			11 x 17 Xerox Copies @			$0.10	$0.00
			Blueprints - 8 1/2 x 11 @			$0.35	$0.00
			Blueprints - 42 x 72 @			$1.30	$0.00
			Bond - 8 1/2 x 11 @			$0.42	$0.00
			Bond - 34" x 68" @			$3.50	$0.00
			Vellum			$3.00	$0.00
			Stick-Ons			$1.00	$0.00
			Cover(s) @			$0.50	$0.00
			Binder(s) @			$0.50	$0.00
			Mylar - 8 1/2 x 11 @			$5.90	$0.00
			Mylar - 3' x 4' @			$21.00	$0.00
	Film and Developing:		Roll(s) @			$20.00	$0.00
					Subtotal		$0.00
MAPS AND DOCUMENTS:	ITEM	QTY	DESCRIPTION			UNIT COST	
	County Tax Maps:	0	Map(s) @			$7.00	$0.00
	USGS Maps:	0	Map(s) @			$7.00	$0.00
					Subtotal		$0.00
Miscellaneous Other	Item	Amount	Description			Cost Per	
							$0.00
							$0.00
	QA Testing		ECS Southeast			$19,936.50	$19,936.50
							$0.00
	Stoclpile Characterization		ECS Southeast			$25,295.00	$25,295.00
							$0.00
					Subtotal		$45,231.50
					TOTAL		**$45,231.50**

*** Sum of all plots**

Attachment 'B'

ECS Southeast, LLC

Proposal for Construction Materials Testing

14 Unit T-Hangar and Taxilanes
Fayetteville, NC

ECS Proposal Number 33:6445

August 16, 2024

August 16, 2024

Greg Kershaw, PE
WK Dickson & Co., Inc
2075 Juniper Lake Road
Charlotte, NC 28208
gkershaw@wkdickson.com

Reference: 14 Unit T-Hangar and Taxilanes
400 Airport Road
Fayetteville, NC
ECS Proposal Number: 33:6445

Dear Mr. Kershaw:

ECS Southeast, LLC (ECS) appreciates this opportunity to submit this proposal to provide construction materials testing (CMT) services for the above-referenced project. This proposal reviews our understanding of the project information, outlines our proposed scope of services, and presents our fee estimate—together with the applicable schedule of unit rates for this project.

Our considerable experience with similar projects will help us provide efficient, cost-effective construction observation, testing, and engineering consulting services. Also, our automated Field Reporting and Electronic Distribution (FRED) system can provide an efficient reporting of field and laboratory activities as discussed later.

PROJECT UNDERSTANDING

We understand that the project will consist of the construction of one 14-unit T-Hangar building. Site preparation will include approximately 15,000 cubic yards of embankment from a borrow source located on the airport property, approximately 870 linear feet of storm drainpipe, approximately 1,200 tones of bituminous asphalt paving for the associated taxilanes, and utility services for the new hangar building (water, sewer, electric).

ECS was provided and has reviewed the Project Manual bid document and Bid Plan Set received by ECS on August 12, 2024.

SCOPE OF SERVICES

We propose to provide qualified engineers and engineering technicians to perform the requested services. The following reporting, testing and inspection services may be requested on this project:

P-152 Excavation, Subgrade, and Embankment

- Observe the contractor proof-rolling the site to observe that unstable soils have been identified and removed, or repaired in-place.
- Conduct laboratory Proctor tests on proposed engineered fill soils.
- Provide continuous observation of fill placement activities for conformance with the project geotechnical report.

- Perform in-place density testing at a minimum of one compaction test per 1000 square yards per the specification and moisture content of fill materials to verify the percent compaction/in-place dry density is in compliance with the project geotechnical report.
- Perform straightedge testing.

P-209 Crushed Aggregate Base Course

- Obtain samples and run gradations.
- Analyze the Aggregate Base Course stone for optimum moisture content and maximum dry density utilizing the specified Proctor method and conduct thickness measurements.
- Conduct in-place density tests on aggregate base course to verify compaction at a minimum of one compaction test per 1000 square yards per the specification.
- Apply a 12 foot straightedge to the material to verify smoothness.

Shallow Foundations

- Periodic inspections and testing by Dynamic Cone Penetrometer of soils at footing bearing level to verify that the soils encountered are satisfactory for the allowable design pressure recommended.

Concrete

- Visually check the concrete in each truck as it arrives on site for proper slump and observe general placement procedures.
- Sample and test plastic concrete to include slump tests, air content, unit weight of lightweight concrete, and temperature.
- Facilities for storage of field curing test samples and initial curing should be provided by the contractor
- Cast and cure 4 by 8 inch concrete cylinder test specimens for compressive strength testing per specifications.
- Deliver test specimens to the ECS laboratory within 24 hours after casting.
- Provide laboratory curing, compressive strength testing and report of concrete cylinder test specimens.
- Perform FF and FL testing on the slab on grade. Provide a report of our findings.

Pavements

- Observation proofrolling stone base course.
- Check the compaction and thickness of stone base course.

Communications

To expedite the timely distribution of our daily reports, our field personnel utilize wireless hand-held technology to collect, process, and return data to our Fayetteville office. Our use of this powerful technology typically facilitates electronic distribution of our reports within approximately **24-48 hours**. This enhanced reporting technology allows us to simultaneously communicate our testing data with all project team members.

The appropriate contractor or owner representative should contact our scheduling coordinator to provide the appropriate level of staffing to meet the project requirements; the main office phone number is 910-401-3288. ***All scheduling requests must be made prior to 3 pm the business day before***

the testing is needed so that the proper personnel may be scheduled for the required inspection task. Each scheduling request will be assigned a work order number so that the scheduled testing and inspection is documented. We also ask that we be provided with one full set of up-to-date project drawings and specifications prior to starting work on this project.

ECS will transmit reports by e-mail (and up to three hard copies via U.S. Mail, if requested). Please list those to whom the reports should be sent and provide their e-mail addresses or mailing addresses, as appropriate, on the attached Proposal Acceptance Form.

FEES/COST OF SERVICES

Based upon the scope of services and our fee schedule, ECS estimates that our services for this project will be on the order of **$19,936.50.** A cost estimate is attached. ECS will invoice for our services on a unit-rate basis in accordance with the unit rates provided in the attached Project Fee Schedule. Invoices will be submitted on a monthly basis—typically on or about the 10th day of each month.

Our estimated cost provided does not constitute a lump-sum or not-to-exceed price for our services. Additional visits, re-inspections and unanticipated scopes of services may be required and will be invoiced in accordance with the attached fee schedule.

At the time of this proposal, a construction schedule was not available, and this cost estimate is based on our assumption of the construction schedule considering the construction drawings and specifications provided. The actual cost may be more or less than our cost estimate and will depend on the duration of construction and the frequency of testing scheduled by the general contractor. Should a defined construction schedule and detailed scope of services, we would be happy to prepare a more defined cost estimate. Should the construction schedule change and/or change in the scope of services differ from the proposed schedule or supplied schedule and scopes, our estimate will be revised utilizing the enclosed unit rates within this proposal. ECS will notify you of any changes in such schedule and/or scope of services prior to executing our services. ECS will invoice only the actual costs of services expended.

AUTHORIZATION

If the scope of work as outlined above and the attached Terms and Conditions are acceptable to you, please sign the attached Proposal Acceptance Form and return one copy of the Proposal Acceptance Form to ECS. Please note that the attached Terms and Conditions of Service are incorporated herein by reference and are an integral part of this agreement between us.

Alternatively, you could issue a letter of acceptance or purchase order. If you opt to do so, ECS would ask that you include the proposal number and date hereof on such documents in order to incorporate this proposal by reference.

By signing the Proposal Acceptance Form—or by referencing this proposal in other documents intended to authorize ECS to proceed with the scope of services described above—you are also accepting the Terms and Conditions of Service and making this proposal the agreement. This proposal is valid for a period of sixty (60) days; beyond that date it may be necessary to revise our schedule or fee.

Fully completing and signing the attached Proposal Acceptance Form will provide formal authorization for ECS to enter the site and perform the above work, as well as providing proper invoicing instructions and distribution lists for reports and correspondence.

Please provide any specific instructions or details not covered in this proposal on the attached Proposal Acceptance Form. Please note we have provided a place for you to enter invoicing instructions and report distribution.

We look forward to the opportunity to work with you on this project and hope to serve as your consultant in the future. If you have questions, or if we can be of additional service, please contact us at (910) 401-3288.

Respectfully submitted,

ECS SOUTHEAST, LLC

Ryan Parrish
CMT Group Supervisor

Jack E. Cowsert, P.E.
Branch Manager

Attachments: Cost Estimate
ECS Fee Schedule
Proposal Acceptance Form
ECS Terms and Conditions of Service

FEE ESTIMATE

CONSTRUCTION MATERIALS TESTING SERVICES

Fay 14-Unit T-Hangar & Taxilanes

ECS Proposal No. 33:6445-P

Field Services:						Quantity		Unit Rate	Cost
Sitework:									
P-152 Testing	20 visits	@	4 hours/visit			80 hours	@	$60.00 / hour	$4,800.00
P-209 Testing	2 visits	@	4 hours/visit			8 hours	@	$60.00 / hour	$480.00
Asphalt Observations	2 visits	@	8 hours/visit			16 hours	@	$60.00 / hour	$960.00
Building:									
Bearing of Soils - Foundations	2 visits	@	2 hours/visit			4 hours	@	$60.00 / hour	$240.00
Concrete - Foundations	2 visits	@	4 hours/visit			8 hours	@	$60.00 / hour	$480.00
Concrete - Slab on Grade	2 visits	@	6 hours/visit			12 hours	@	$60.00 / hour	$720.00
Concrete - Sidewalk	1 visits	@	4 hours/visit			4 hours	@	$60.00 / hour	$240.00
Specimen Pick Up	5 visits	@	1 hours/visit			5 hours	@	$60.00 / hour	$300.00
Travel (round trip):	36 visits	@	1 hour/visit			36 hours	@	$60.00 / hour	$2,160.00
Staffed Professional:									
Proofroll Evaluation	1 visit	@	2 hours/visit			2 hours	@	$145.00 /hour	$290.00
Travel (round trip):	1 visit	@	1 hour/visit			1 hours	@	$145.00 / hour	$145.00
Mileage (round trip):	37 visits	@	30 miles/visit			1110 miles	@	$0.85 / mile	$943.50
Field Services Subtotal:									**$11,758.50**
Laboratory Testing:						**Quantity**		**Unit Rate**	**Cost**
Standad Proctor (ASTM D698)						2 samples	@	$150.00 / sample	$300.00
Atterburg Limits						2 samples	@	$90.00 / sample	$180.00
Grain Size Analysis						2 samples	@	$90.00 / sample	$180.00
Compressive Strength of Cylinders (4X8)						7 set(s)	@	$120.00 / set	$840.00
Hazardous Materials								Lump Sum	$450.00
Laboratory Testing Subtotal:									**$1,950.00**
Equipment Rental:						**Quantity**		**Unit Rate**	**Cost**
Nuclear Guage						24 day(s)	@	$75.00 / day	$1,800.00
Equipment Rental Subtotal:									**$1,800.00**
Project Management/Report Review:						**Quantity**		**Unit Rate**	**Cost**
Principal Engineer:	41 reports	@	0.25 hours/report			10.25 hours	@	$225.00 / hour	$2,306.25
Project Manager:	41 reports	@	0.25 hours/report			10.25 hours	@	$145.00 / hour	$1,486.25
Secretary:	41 reports	@	0.25 hours/report			10.25 hours	@	$62.00 / hour	$635.50
Project Management Subtotal:									**$4,428.00**
ESTIMATED TOTAL COST:									**$19,936.50**

FEE SCHEDULE
CONSTRUCTION MATERIALS TESTING

Soil or Materials Field Technician (Concrete and Soils)	$ 60.00/hour
Secretary	$ 62.00/hour
Asphalt Technician	$ 60.00/hour
Masonry Special Inspector	$ 90.00/hour
Concrete Special Inspector	$ 90.00/hour
Fireproofing Technician	$ 90.00/hour
CWI/NDE Technician Level 2	$ 130.00/hour
Project Manager	$ 145.00/hour
Principal Engineer/Special Inspector	$ 225.00/hour
Transportation via company vehicle	$ 0.85/mile

Note: Charges for engineering and technical personnel will be made for time spent in the field, in engineering analysis, in preparation and review of reports, and in travel to and from our office.
Overtime = Standard Rate x 1.5 for services performed exceeding 8 hours per day, outside our normal business hours of 7:00 am to 5:00 pm, holidays, Saturday, and Sunday.

EQUIPMENT and LABORATORY

Curing Box fee	$100.00 each
Standard Proctor (ASTM D-698) 4 inch mold	$150.00 each
Modified Proctor (ASTM D-1557) 4 inch mold	$175.00 each
Asphalt Density Determination	$ 60.00/core
Atterberg Limits (LL & PL) Determination (ASTM D-4318)	$ 90.00/test
Grain Size Analysis Test (ASTM D-422)	$ 90.00/test
Moisture Content (ASTM D-2216)	$ 20.00/test
Hardened Density of Pervious Cores	$ 40.00/test
Testing of Cylinders, Core Specimens:	
Compressive strength of grout prisms	$20.00 each
Compressive strength of masonry prisms	$100.00 each
Compressive strength of mortar cubes	$15.00 each
Compressive strength of concrete cylinders	$20.00 each
Compressive strength of concrete cores, (ASTM C-42)	$ 50.00 each
Density Test Equipment (Nuclear Gauge/Sand Cone/Drive Tube)	$ 75.00/day
Fireproofing Test Equipment	$ 100.00/day
Floor Flatness Equipment	$ 200.00/day
Ultrasonic Weld Testing Equipment	$ 250.00/day
Core machine	$ 200.00/day
Rental Equipment & Non-standard Supplies	Cost x 1.15

Note: The above charges will be made for tests and equipment operated by ECS SOUTHEAST, LLC personnel in addition to personnel charges already listed.

Attachment 'C'

ECS Southeast, LLC

Proposal for Stockpile Characterization Sampling

FAY 14-Unit T-Hangar
Doc Bennett Road, Fayetteville, North Carolina 28306

For: WK Dickson & Co., Inc.
1213 West Morehead Street, Suite 300, Charlotte, North Carolina 28208

ECS Proposal Number 49:46240P

August 28, 2024

August 28, 2024

Mr. Greg Kershaw, PE
WK Dickson & Co., Inc.
1213 West Morehead Street
Suite 300
Charlotte, North Carolina 28208

ECS Proposal No. 49:46240P

Reference: Proposal for Stockpile Characterization Sampling, FAY 14-Unit T-Hangar, Doc Bennett Road, Fayetteville, Cumberland County, North Carolina

Dear Mr. Kershaw:

ECS Southeast, LLC (ECS) is pleased to provide WK Dickson & Co., Inc. (Client) with this proposal for performing Stockpile Characterization Sampling for the FAY 14-Unit T-Hangar. The property is located at Doc Bennett Road in Fayetteville, Cumberland County, North Carolina 28306.

Based on the information available, a property description is noted within the attached proposal along with a description of our scope of services. Our proposal contains a summary of the relevant information provided, a project schedule, and the estimated fees for completion of the proposed services.

ECS appreciates the opportunity to be of service to you on this project. If you have any questions or comments concerning this proposal or would like adjustments to our proposed scope of services or schedule, please do not hesitate to contact us.

ECS Southeast, LLC

Samantha M. Szakasits, P.G.
Staff Project Manager
sszakasits@ecslimited.com
919-616-2679

Scott M. Werley, P.G.
Environmental Principal
swerley@ecslimited.com
984-297-7285

PROJECT INFORMATION AND SCOPE OF SERVICES

Project Description

The subject property is located near Doc Bennett Road in Fayetteville, Cumberland County, North Carolina 28306. According to the Cumberland County Online GIS website, the subject property is identified as Parcel Identification Number (PIN) 0435701215, consists of 937.13 acres, and is owned by the City of Fayetteville.

Scope of Services

Based on the plans for future activities of the site to utilize a stockpile for beneficial fill, and as requested by the client, ECS has prepared the following Scope of Services in order to characterize the 9,000 cubic yards of stockpiled soil in an effort to determine its potential for use as beneficial fill on the subject property.

Pre-Assessment Activities

ECS will conduct the following pre-assessment activities:

- ECS will contact North Carolina 811 to locate public underground utilities at the site. This notification requires minimum 72-hour response time, exclusive of holidays and weekends. Please note that public utility location typically will only identify and mark utilities from utility easements to the associated meters. However, our experience indicates that North Carolina 811 will not locate utilities beyond the point of distribution (meters or gauge points) on private property.
- ECS will prepare a site-specific health and safety plan (HASP). The HASP will document the known or suspected hazards, applicable personal protective equipment (PPE) for site personnel, and emergency response procedures. Prior to commencing field activities, ECS, its subcontractors, and applicable site personnel will review the site-specific HASP.
- ECS will contract and coordinate with a North Carolina certified laboratory to provide preserved sample containers for the collection and subsequent analysis of soil.

Soil Sampling

ECS will mobilize to the site and use a decontaminated stainless-steel hand auger to collect up to nine (9) 5-point composited soil samples at the subject property from the estimated 9,000 cubic yard (CY) stockpile. Approximate sample locations are indicated on **Figure 1**. The sample locations may be adjusted based on conditions observed in the field.

The stockpile is estimated to contain approximately 9,000 CY, ECS will divide each area of concern into approximately equivalent 1,000 CY Areas, and will collect one representative soil quality sample per area from depths ranging from approximately 1 feet below ground surface (bgs) to 3 feet bgs. ECS will also collect up to five (5) grab soil samples for discreet volatile organic compound (VOC) analysis, one from each approximately 1,000 CY Area.

ECS will collect soil continuously from the ground surface to the termination depth of the soil borings. The soil from each boring, within each area, will be field screened for apparent evidence of impacts by observing for staining, petroleum or chemical odors, and relative volatile organic vapor readings using a Photoionization Detector (PID) or similar device. In an effort to minimize volatilization of VOC samples, an aliquot of soil from each boring will be placed into a separate resealable container with as limited headspace as feasible and set aside in a cooler with ice for potential analysis purposes.

Based upon field screening results, one grab soil sample from each Area exhibiting the highest PID reading or apparent evidence of impacts will be collected and submitted to laboratory analysis of VOCs using EPA Method 8260. Additionally, soil from each boring within each Area will be composited and submitted for laboratory analysis of Semi-Volatile Organic Compounds (SVOCs) using EPA Method 8270, polycyclic aromatic hydrocarbons (PAHs) using EPA Method 8270, polychlorinated biphenyls (PCBs) using EPA Method 8082, total metals regulated under the Resource Conservation and Recovery Act (RCRA metals) using EPA Method 6020/7471, hexavalent chromium (Cr VI) by EPA Method 7199, organochlorine pesticides by EPA Method 8081, organophosphorus pesticides by EPA Method 8141, chlorinated herbicides by EPA Method 8151, and per- and polyfluoroalkyl substances (PFAS) using EPA Method 1633. As such, one grab sample and one composite sample will be collected and submitted for laboratory analysis from each Area.

One equipment rinse blank will be collected during the assessment for quality assurance/ quality control (QA/QC) purposes with the use of PFAS-free water obtained from the laboratory. The equipment rinse blank will be submitted for analysis by EPA Method 1633.

One field blank will be collected during the assessment for QA/QC purposes by pouring PFAS-free water directly into a laboratory provided container while in the field. The field blank will be submitted for analysis of PFAS by EPA Method 1633.

One field duplicate sample is to be collected for QA/QC purposes from one of the composite and discreet VOC stockpile characterization samples collected. The field duplicate will be submitted for analysis by EPA Method 1633.

Due to the ubiquitous nature of PFAS in the environment, sampling conducted to determine PFAS concentrations require specific considerations and protocols. Sampling requirements are different and include special considerations due to PFAS containing materials in many typical sampling equipment and supplies, and everyday products. There is also increased potential for the cross-contamination of samples given PFAS chemical properties and their presence in many everyday items including clothing, sunscreens, insect repellents, and personal protective equipment (PPE) items. The potential for cross-contamination is exacerbated by the low analytical laboratory detection levels that are reported down to the parts per trillion (ppt) range. This demands the implementation of specific sampling practices and protocols, field and laboratory QA/QC, and choice of sampling equipment/container materials. These actions are required in order to accurately interpret the results reported by the analytical laboratory, and to bolster the collection of defensible data. As such, ECS will follow sampling guidance and implement appropriate QA/QC for the collection and analysis of groundwater samples by a North Carolina Certified Laboratory in accordance with the following Guidance Documents:

- *USDOD EDQW 2017, Revision 1.2, Bottle Selection and other Sampling Considerations When Sampling for Per and Poly-Fluoroalkyl Substances. http://www.denix.osd.mil/edqw/home/*
- *ITRC PFAS Fact Sheet, August 2020, Sampling Precautions and Laboratory Analytical Methods for Per- and Polyfluoroalkyl Substances (PFAS)*
- *ECS Southeast, LLC, May 2023, SOP No. 13, Revision No. 0, Standard Operating Procedure – Preparation For Sampling, Analysis, & Assessment of Per- and Polyfluoroalkyl Substances (PFAS)*

In addition, ECS's PFAS QA/QC Acceptable and Unacceptable Equipment List and PFAS Sampling Checklist are attached to this proposal.

Reporting

Information obtained during the performance of the above-referenced environmental services will be summarized in a summary letter report. The summary letter report will contain methodologies and procedures utilized to perform the work, figures, and laboratory data. Laboratory data will be compared to the North Carolina Department of Environmental Quality (NCDEQ) Preliminary Soil Remediation Goals (PSRGs). In addition, an opinion will be provided as to whether additional sampling and/or evaluations would be warranted or required by local, state, and/or federal regulatory agencies.

Out of Scope Items

During the performance of our Scope of Services, additional environmental issues beyond the Scope of Services outlined within this proposal may be encountered. ECS may contact WK Dickson & Co., Inc. to discuss the relevance and significance of the additional issues to determine if the observation requires additional assessment, inclusion in our final report, or a modification to our contract.

Safety

ECS personnel are responsible for their own personal safety. While on site, if ECS personnel deem a condition unsafe and the performance of our scope of services cannot be completed, you will be notified of the unsafe condition. ECS personnel will not proceed further with the scope of services in that area until the unsafe condition is corrected. Access delays associated with safety concerns may result in additional fees.

PROJECT FEES AND SCHEDULE

Meetings

Meetings requested by WK Dickson & Co., Inc. beyond the Scope of Services outlined above will be invoiced on a time and materials basis. Meetings after typical office hours (Monday through Friday 8 am to 5 pm) will be invoiced at 1.5 times the normal rate.

Project Fees

ECS will provide the proposed scope of services for a lump sum fee of **$25,295.00**. A cost breakdown by line item is provided as an attachment.

Project Schedule

Based on our present schedule, we can begin the field activities within three to five business days of receiving your written authorization to proceed. The fieldwork is anticipated to require up to two days to complete. Laboratory analytical results are anticipated to be available within seven to ten business days of receipt of samples by the laboratory. PFAS analytical results are anticipated to be available within 20 to 25 business days of receipt of samples by the laboratory. We can provide you with verbal results as soon as they are available. The written report will be submitted within three to five business days of our receipt of the laboratory results. Please note that we cannot begin our field activities until we receive your written authorization.

If other items are required because of unexpected field conditions, or because of a request for additional services, they would be invoiced as an agreed-to lump sum fee or in accordance with the ECS Fee Schedule (available upon request). Before expanding our scope of service that increased our fee, you would be informed of our intentions for both your review and authorization.

LIMITATIONS AND ASSUMPTIONS

Conclusions and recommendations pertaining to environmental conditions at the subject site are limited to the conditions observed at the time ECS personnel are onsite. The observations made only represent the locations at the time and day of collection. This proposed scope of work is not designed or intended to provide an comprehensive assessment of potential environmental impacts at the subject property.

We have made the following assumptions in developing this proposal:

- The fee estimated for the proposed scope of services assumes work can be completed within normal business hours. For work scheduled after hours and/or weekends, additional costs may be applied. Prices are based on performing work on a non-holiday weekday during normal business hours (7:00am – 5:00pm, Monday – Friday);
- Prices presented herein are valid for 60 days from the date of this proposal;
- One electronic version (PDF format) of the report will be provided upon completion of the project.
- Laboratory pricing is based on standard turnaround time (7-10 business days);
- PFAS analytical pricing is based on standard turnaround time (20-25 business days);
- ECS assumes unrestricted access to the stockpile located at the site without additional special training or security badging requirements;
- Additional project work not specifically addressed by this proposal shall be charged at a time and materials rate;
- Hand auger drilling was selected for timing and ease of access. It is assumed that borings can be advanced to the desired depths indicated herein and sampling of soil can be collected using hand auger drilling methods;
- ECS understands that these assessment activities are not being conducted for regulatory purposes and are for general assessment purposes as part of due diligence activities. Should assessment activities be requested for regulatory purposes, ECS can provide these services; however, additional assessment activities and fees may be required;
- Additional work, if required, shall be authorized by the client prior to initiation; and,

- If requested, ECS can provide reliance letters for our reports for an additional fee of $300.00 per letter/entity. Future reliance offered by ECS would be bound to the same contracted Terms & Conditions of Service agreed to between WK Dickson & Co., Inc. and ECS.

PROPOSAL ACCEPTANCE

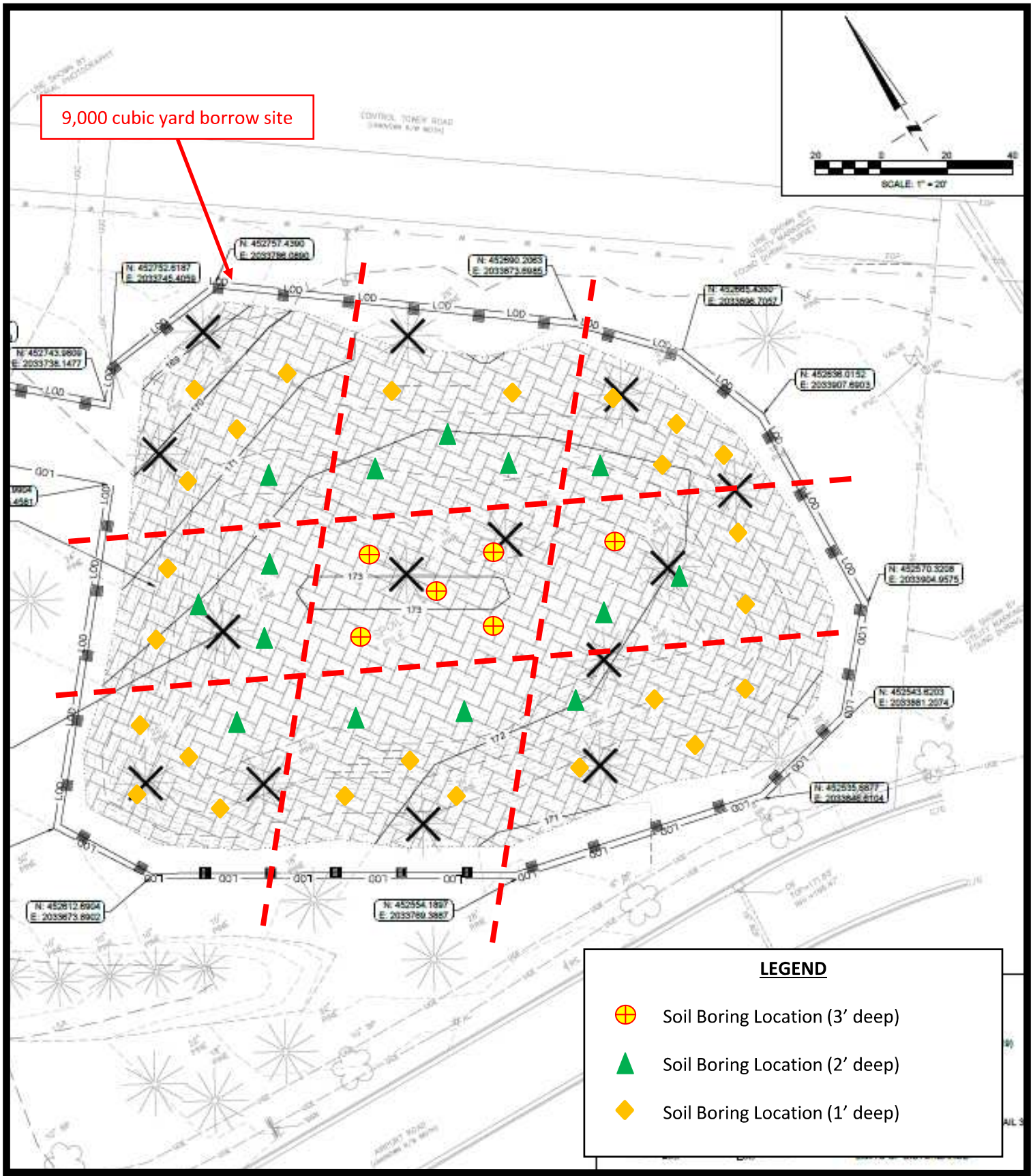
Please complete the Proposal Acceptance page and return one copy to ECS to indicate acceptance of this proposal and to initiate services on the referenced project. The Client's signature indicates that he/she has the authority to bind the Client, that he/she has read or has had the opportunity to read the accompanying Terms and Conditions of Service and agrees to be bound by such Terms and Conditions of Service.

Proposal Acceptance Form

Service	Initial
Stockpile Characterization Sampling ($25,295.00)	

PROPOSAL INFORMATION	
ECS Proposal Number	49:46240P dated August 28, 2024
Scope of Work	Stockpile Characterization Sampling
Location	Doc Bennett Road, Fayetteville, North Carolina 28306
CLIENT INFORMATION	
Signature - Authorized Representative for Entity Responsible for Payment	
Print or Type Name of Client and Company	
Date of Execution	
Proposal Addressee - Name	Greg Kershaw, PE
Proposal Addressee - Company	WK Dickson & Co., Inc.
INVOICE INFORMATION **Please Print or Type Below if Invoice Addressee Different Than Proposal Addressee or Special Invoicing Instructions**	
Invoice Addressee - Name	
Invoice Addressee - Company	
Invoice Addressee - Street Address 1	
Invoice Addressee - Street Address 2	
Invoice Addressee - City, State, Zip Code	
Invoice Addressee - Email	
Invoice Addressee - Phone Number	
Purchase Order Number	
Client Project/Account Number	
Pay Application Required	

Appendix I: Proposed Sample Location Plan



SOURCE:
W.K. DICKSON
GRADING, DRAINAGE, AND EROSION CONTROL – BORROW AREA
Dated August 2024

SCALE SHOWN ABOVE

FIGURE 3
PROPOSED SAMPLE LOCATION MAP
FAY 14-Unit T-Hanger
Stockpile Characterization
Fayetteville, Cumberland County, North Carolina

ECS Proposal Number: 49:46240P

Appendix II: Cost Estimate

ECS Services

Task/Item	Units	Unit Qty.	Unit Rate	Cost
NC811, Laboratory, and Project Coordination	lump sum	1.0	$550.00	$550.00
Health & Safety Plan (HASP)	lump sum	1.0	$300.00	$300.00
ECS Field Activities (includes travel & labor [two-man crew])	per day	2.0	$2,100.00	$4,200.00
Mileage, Sampling Supplies, and Rental Equipment	per day	2.0	$350.00	$700.00
Project Management	lump sum	1.0	$2,000.00	$2,000.00
Summary Letter Report	lump sum	1.0	$1,000.00	$1,000.00
			Estimated Subtotal:	**$8,750.00**

Laboratory Analytical Services

Task/Item	Units	Unit Qty.	Unit Rate	Cost
Soil Analytical				
EPA Method 8260 (VOCs)	per sample	9.0	$100.00	$900.00
EPA Method 8270 (SVOCs)	per sample	9.0	$195.00	$1,755.00
EPA Method 8270 (PAHs)	per sample	9.0	$95.00	$855.00
EPA Method 8082 (PCBs)	per sample	9.0	$75.00	$675.00
EPA Method 8081 (Organochlorine Pesticides)	per sample	9.0	$85.00	$765.00
EPA Method 8141 (Organophosphorus Pesticides)	per sample	9.0	$220.00	$1,980.00
EPA Method 8151 (Chlorinated Herbicides)	per sample	9.0	$175.00	$1,575.00
EPA Method 6020 (RCRA 8-Metels)	per sample	9.0	$85.00	$765.00
EPA Method 7199 (Cr VI)	per sample	9.0	$115.00	$1,035.00
EPA Method 1633 (PFAS)	per sample	9.0	$520.00	$4,680.00
			Estimated Subtotal:	**$14,985.00**
QA/QC Analytical (Duplicate, Equipment Blank, and Field Blank)				
EPA Method 1633 (PFAS)	per sample	3.0	$520.00	$1,560.00
			Estimated Subtotal:	**$1,560.00**
			Total Estimated Fee:	**$25,295.00**

Appendix III: PFAS Documents

PFAS Quality Assurance/Control

Acceptable and Unacceptable Equipment (May 2021)

ECS Southeast, LLP

ACCEPTABLE	NOT ACCEPTABLE
Sampling Supplies & Equipment	
High Density Polyethylene (HDPE) or Polypropylene (PP) materials/sample containers	Glass or LDPE Containers
Lined or unlined HDPE or polypropylene caps	Anything containing Teflon®, Kynar®, Neoflon®, or Tefzel®
Silicon tubing	Anything that is waterproof, water resistant, or insect proof (i.e. Permethrin)
Loose leaf paper (nothing water resistant)	Plastic clipboards, binders, or notebooks
Aluminum clipboards	Post-It™ Notes
Fine or Ultra-Fine Tipped Sharpies™ only, ball point pens	Chemical Ice Packs (typically blue in color)
Regular Ice. Ice and samples to be bagged separately, with ice double bagged.	Waterproof field notebooks
LDPE Bags (ex. Ziploc™) may be used as long as it does not come into direct contact with the sample media. (i.e. to bag ice and samples)	
Clothing and PPE	
Clothes that have been washed at least half a dozen times, made of synthetic or natural fibers. (Cotton preferred)	New clothes
NO fabric softener used within the past six washes	Water resistant, waterproof, stain treated, Gore-Tex® clothing or clothing treated with permethrin (unless product is otherwise listed).
Boots or boot covers made of polyurethane and/or polyvinyl chloride (PVC)	Clothes washed with fabric softener
All natural sunscreen or insect repellents (best to avoid if possible). If applied, be sure to apply in the staging area, far from the sample collection area. Thoroughly wash hands after application.	Any and all items containing Tyvek®
Powder-Free Nitrile Gloves	Any and all items containing Gore-Tex®
OFF® Deep Woods, Sawyer® Permethrin, Banana Boat® Sport Performance Sunscreen Lotion SPF 30, Neutrogena® Ultra-Sheer Dry Touch Sunscreen SPF 30.	Cosmetics, lotions, etc. (including personal hygiene products used during showering) the day of sampling. <u>This includes the use of shampoo/floss on the day of sampling.</u>
Decontamination	
Alconox®, Liquinox®, and/or Citranox® mixed with PFAS-Free, deionized water.	Decon 90
Scrub brushes and buckets shall be comprised of polyethylene or polyvinylchloride (PVC).	Municipal water
Equipment shall be rinsed at least twice after decontamination.	
ONLY PFAS-Free water may be used in the decontamination process. PFAS-Free water may be purchased from the analytical laboratory.	
Food	
Bottled water and other drinks SHALL be consumed and stay within the staging area.	No eating fast food, pre-packaged food, anything with plastic, water-resistant, or disposable wrapping.

<u>Notes:</u>

Anything waterproof, water resistant, stainproof, etc. should be treated as a PFAS containing material.

Equipment shall be decontaminated prior to use.

If it is unknown whether an item contains PFAS, do not use it without first confirming that it is PFAS-Free with a field blank.

ALL contractors (drillers, private utility locators, etc.) must adhere to these same guidelines.

<u>Additional Resources:</u>

Michigan Department of Environmental Quality (MDEQ) General PFAS Sampling Guidance (October 2018)
https://www.michigan.gov/documents/pfasresponse/General_PFAS_Sampling_Guidance_634597_7.pdf

PFAS Sampling Checklist

Date: _____

Weather (*temp./precipitation*): _____ Site Name: _____

Field Clothing and PPE:

- ☐ No clothing or boots containing Gore-Tex™
- ☐ All safety boots made from polyurethane and PVC
- ☐ No materials containing Tyvek®
- ☐ Field crew has not used fabric softener on clothing
- ☐ Field crew has not used cosmetics, moisturizers, hand cream, or other related products this morning
- ☐ Field crew has not applied unauthorized sunscreen or insect repellant

Field Equipment:

- ☐ No Teflon® or LDPE containing materials on-site
- ☐ All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- ☐ No waterproof field books on-site
- ☐ No plastic clipboards, binders, or spiral hard cover notebooks on-site
- ☐ Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- ☐ All sample containers made of HDPE or polypropylene
- ☐ Caps are unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- ☐ Wet weather gear made of polyurethane and PVC only

Equipment Decontamination:

- ☐ "PFC-free" water on-site for decontamination of sample equipment. No other water sources to be used.
- ☐ Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- ☐ No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Lead shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the site or removal of worker offsite until in compliance.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

_____

_____

_____

Field Lead Name: _____

Field Lead Signature: _____ Time: _____

PFAS Sampling – Prohibited and Acceptable Items

Prohibited	Acceptable
Field Equipment	
Teflon® containing materials	High-density polyethylene (HDPE) materials
Low density polyethylene (LDPE) materials	Acetate Liners
	Silicon Tubing
Waterproof field books	Loose paper (non-waterproof)
Plastic clipboards, binders, or spiral hard cover notebooks	Aluminum field clipboards or with Masonite
Chemical (blue) ice packs	Regular ice
Field Clothing and PPE	
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex™	Well-laundered clothing made of natural fibers (preferable cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-Tex™	Boots made with polyurethane and PVC
Tyvek®	Cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal cleaning/showering routine on the morning of sampling	**Sunscreens** - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss my face, Baby sunscreens that are "free" or "natural" **Insect Repellents** - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics **Sunscreen and insect repellant -** Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion
Sample Containers	
LDPE or glass containers	HDPE or polypropylene
Teflon-lined caps	Unlined polypropylene caps
Rain Events	
Waterproof or resistant rain gear	Gazebo tent that is only touched or moved prior to and following sampling activities
Equipment Decontamination	
Decon 90®	Alconox® and/or Liquinox®
Water from an on-site well	Potable water from municipal drinking water supply
Food Considerations	
All food and drink, with exceptions noted on right	Bottled water and hydration fluids (i.e, Gatorade® and Powerade®) to be brought and consumed only in the staging areas

PREPARATION FOR SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

1 OBJECTIVE

The purpose of this standard operating procedure (SOP) is to formalize the process for developing a plan to collect environmental samples that will be submitted for analysis of Per- and Polyfluoroalkyl Substances (PFAS). This is not intended to assign procedures for individual site sampling protocol, but rather, to provide a formalized approach to the collection of environmental samples to be analyzed for PFAS.

Due to the extensive worldwide use of PFAS resulting in trace levels of PFAS, in most environmental media and the low parts per trillion (PPT) screening levels, sampling and analysis protocols for PFAS require a heightened level of thoroughness to avoid cross-contamination and achieve a level of accuracy and precision to support defensible project decisions. The collection of accurate and representative data will support the development of a defensible conceptual site model (CSM), and ultimately a final remedy for a project.

This SOP provides the user with the appropriate tools and information to develop a site-specific sampling and analysis program (SAP) for obtaining and submitting environmental samples for analysis of PFAS. This includes selecting the appropriate personal protective equipment, bottle ware, sampling equipment, etc. Guidance will also be provided on avoiding PFAS cross-contamination during sampling that includes the establishment of work zones.

2 BACKGROUND

PFAS are a class of emerging chemicals of concern composed of more than 4,700 human-made, fluorinated, organic chemicals. The EPA further defines PFAS as fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without and H/Cl/Br/I atom attached to it), i.e, with a few noted exceptions, any chemical with at least a perfluorinated methyl group (-CF3) or a perfluorinated methylene group (-CF2)is a PFAS. The actual number of compounds is continuously changing, as some PFAS are no longer produced due to regulatory and voluntary actions, while new ones are created as alternatives and/or transition to shorter chain PFAS daughter compounds. The carbon-fluorine bond that exists in PFAS is one of the strongest bonds in nature, they are tough to break and are resistant to thermal, chemical, and biological degradation.

Due to their unique chemical properties, various PFAS can lower surface tension (act as surfactants), are oil-repelling (oleophobic), and are water-repelling (hydrophobic), yet are also relatively water soluble. They have been used extensively in many industries worldwide for a wide variety of applications. PFAS were first invented in the late 1930's and commercially used from the 1940's as non-stick coatings. PFAS continued to be used in many industries and various products as more PFAS were developed with unique chemical properties. **Table 1** – Overview Of Major Historical and Current Uses Of Non-Polymeric Per- and Polyfluoroalkyl Substances and **Table 2** – Overview Of Major Historical and Current Uses Of Polymeric Per- and Polyfluoroalkyl Substances present some of the

documented PFAS (https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/aboutpfass/). The presence of PFAS in these materials is a potential source of environmental concern and cross-contamination.

Table 1 – Overview of Major Historical and Current Uses of Non-Polymeric Per- and Polyfluoroalkyl Substances*

INDUSTRY BRANCH: NON-POLYMER	
1. Aviation, aerospace & defense	additives in aviation hydraulic fluid
2. Biocides	active ingredient in plant growth regulators or ant baits; enhancer in pesticides formulations
3. Construction products	additives in paints and coatings
4. Electronics	flame retardants
5. Firefighting	film formers in AFFF and in FFFP
6. Household products	wetting agent or surfactant in products such as floor polishes and cleaning agents
7. Metal plating	wetting agent, mist/fume suppressing agent
8. Oil and mining production	surfactants in oil well stimulation
9. Polymerization	(co)monomer of fluoropolymers & side-chain fluorinated polymers

*Note: Some uses may be obsolete and replaced by (non)fluorinated alternatives.

AFFF = aqueous film-forming foams (aka fire-fighting foam)

FFFPs = film-forming fluoroprotein.

Table 2. Overview of Major Historical and Current Uses of Polymeric Per- and Polyfluoroalkyl Substances

INDUSTRY BRANCH: POLYMER	
1. Automotive	raw materials for components such as low-friction bearings & seals and lubricants
2. Aviation, aerospace & defense	insulators; "solder sleeves"
3. Cable and wiring	coating for weathering, flame, and soil resistance, surface-treatment agent for conserving landmarks
4. Construction	coating of architectural materials (fabrics, metals, stone, tiles, etc.); additives in paints
5. Electronics	insulators; “solder sleeves,” vapor-phase soldering media
6. Energy	film to cover solar collectors due to weatherability
7. Firefighting	raw materials for fire-fighting equipment, including protective clothing fuel repellents, foam stabilizers in AR-AFFF and FFP; coating for firefighting equipment
8. Food processing	fabrication materials
9. Household products	nonstick coating
10. Medical articles	surgical patches, cardiovascular grafts, raw materials for implants in the human body, stain- and water-repellents for surgical drapes and gowns
11. Paper and packaging	oil and grease repellent
12. Semiconductors	raw materials for equipment
13. Textiles, Leather, and Apparel	raw materials for highly porous fabrics, oil and water repellent and stain release, oil, and water repellents

Source: This table is an extract from the Synthesis paper on per and polyfluorinated chemicals (PFCs) (see below).

AR-AFFF = alcohol-resistant aqueous fire-fighting foams

FFFPs = film-forming fluoroprotein

The probability of false positives is relatively high during PFAS sample collection due to the potential for many sources of cross-contamination, combined with low laboratory detection limits (nanograms per liter (ng/L) or ppt). There are many products that could be found in the sampling environment, that have not been documented to either contain or not contain PFAS, and may contact the samples, introducing cross-contamination.

3 WORK ZONES

An essential element of a hazardous substance release site is the establishment of safety or work zones. These zones are established primarily to reduce the accidental spread of hazardous substances by workers or equipment from contaminated areas to clean areas. For sites where PFAS are the primary substance of concern, it is also important to limit cross-contamination from outside sources, which makes it imperative to establish safety or work zones. Safety or work zones specify:

- The type of operations that will occur in each safety or work zone.
- The degree of hazard at different locations within the contaminant release site.
- The areas at the site that should be avoided by unauthorized or unprotected employees.

The most frequently identified safety or work zones are below:

1) The exclusion zone (or hot zone) is the area with actual or potential contamination and the highest potential for exposure to contaminant.

    a) No clothes, materials, supplies, or equipment containing PFAS can enter the exclusion zone.

2) The contamination reduction zone (or warm zone) is the transition area between the exclusion and support zones. This area is where site workers enter and exit the exclusion zone and where decontamination activities take place.

    a) Site workers entering the exclusion zone will need to thoroughly wash exposed skin (i.e., face and hands) and don the appropriate PFAS-free personal protection equipment (PPE).

3) The support zone (or cold zone) is the area of the site that is free from contamination and that may be safely used as a planning and staging area.

    a) Site workers will be aware of the requirement to not to allow materials suspected of or containing PFAS from entering the support zone

4 PFAS CROSS-CONTAMINATION POTENTIAL SOURCES

Potential sources of PFAS cross-contamination in the typical sampling environment include:

- water used during drilling or decontamination
- materials used within the sampling environment
- sampling equipment.
- sampling containers.
- field clothing and PPE.
- sun and biological protection products.
- personal hygiene and personal care products (PCPs)
- food packaging
- the environment itself

4.1 PFAS-Free Water

PFAS-free water is defined as water that does not contain significant concentrations of compounds in a specific PFAS analyte list that is being analyzed at a project defined level. The concentrations of PFAS in the water depend on project data quality objectives and could be less than the laboratory reporting limit, <1/2 the limit of quantitation, or other defined criteria for the specific PFAS chemicals of concern.

One important task for a project is to identify a PFAS-free water source to use for decontamination of sampling and drilling equipment when applicable. The decontamination of sampling tools or small equipment can be performed using laboratory-supplied verified PFAS-free water.

4.2 Materials Screening

Materials screening will be performed during the Health and Safety Plan (HASP) and Quality Assurance Project Plan (QAPP) development for sampling program. The screening will be performed on items and materials that are expected to come into contact with the samples.

Material screening will include a review of Safety Data Sheets (SDSs). Make sure the review uses current SDSs, because the actual composition of a particular item or material may change over time without changing the actual item or material name. Products from the United States or abroad will be screened. Text fragments such as “perfluoro,” “fluoro,” or “fluorosurfactant” may identify the use of PFAS in specific items or materials.

4.3 Sampling Equipment

Sampling equipment used for sampling of PFAS must be made from acceptable materials, which include high-density polyethylene (HDPE), polypropylene, silicone, stainless steel, nylon, polyvinyl chloride (PVC), acetate, and cotton. Sampling equipment that contains PFAS-based (fluoropolymers) parts that would be in direct contact with the sample or sampling environment are prohibited. These fluoropolymers include, but are not limited to:

- Polytetrafluoroethylene (PTFE), including the trademark Teflon® and Hostaflon®, which can be in ball check-valves on certain bailers, lining of some hoses and tubing, wiring, certain kinds of gears, lubricant, and some objects that require the sliding action of parts.
- Polyvinylidene fluoride (PVDF), including the trademark Kynar®, which can be in tubing, films/coatings on aluminum, galvanized or aluminized steel, wire insulators, and lithium-ion batteries.
- Polychlorotrifluoroethylene (PCTFE), including the trademark Neoflon®, which can be in many valves, seals, gaskets, and food packaging.
- Ethylene-tetrafluoro-ethylene (ETFE), including the trademark Tefzel®, which can be in many wire and cable insulation and covers, films for roofing and siding, liners in pipes, and some cable tie wraps.
- Fluorinated ethylene propylene (FEP), including the trademarks Teflon® FEP and Hostaflon® FEP, and may also include Neoflon®, which can be in wire and cable insulation and covers, pipe linings, and some labware.

Equipment that contains PFAS-coated parts (e.g., Teflon-coated parts) can be used if the PFAS-coated part is internal to the equipment and is not in direct contact with the external environment or the sample. Sampling equipment that has parts made of low density polyethylene (LDPE) should be avoided if the part comes in direct contact with the sample. However, if it is necessary, equipment that have parts made of LDPE may be used if an equipment blank collected with the use of laboratory supplied PFAS-free water has confirmed it to be PFAS-free.

Sampling equipment used for grab sampling, including cable ties, extension rods, and couplings, should be made of materials that are known to be PFAS-free. Recommended materials for this sampling equipment include:

- Cable ties made of natural rubber or nylon or uncoated metal springs.
- Extension rods made of materials that are known to be PFAS-free.
- Stainless Steel Couplings.

Automatic sampling has an increased potential for cross-contamination because the tubing, valves, strainers, suction lines, distribution nozzles, and other parts may be made from PFAS (fluoropolymers). Automatic sampling should only be used if a representative sample cannot otherwise be collected. If automatic sampling is used, then parts made from preferable materials, should be used when possible, including:

- high-density, polyethylene (HDPE)
- polypropylene
- silicone
- stainless steel
- nylon
- PVC
- acetate

The parts on the sampler should be screened prior to sampling by reviewing the SDSs (if available) and collecting an equipment blank to verify that the parts are PFAS-free. Additionally, the strainer should be decontaminated or replaced between each sampling event.

Regardless of the sampling set-up or equipment selected, an equipment blank must be taken to verify that the equipment is not contaminating the sample.

4.4 Sample Containers

Sample containers used for PFAS sampling should come from the laboratory that is performing the PFAS analysis with the following considerations:

- High-density polyethylene (HDPE) or polypropylene sample bottles with Teflon®-free caps are the preferred sampling containers for PFAS sampling.
- PFAS may adsorb to glass containers and therefore glass should not be used for water, leachate, or other aqueous samples.
- Glass containers may be used for dry or solid samples, provided that adsorbed PFAS can be extracted by the laboratory as part of the sample preparation procedure.
- Sample containers made from low-density polyethylene (LDPE) should not be used as PFAS are used in the manufacturing process of these containers. LDPE can be found in many sample containers including bottles and plastic bags.

In addition, pre-cleaned coolers, sample labels, and chain of custody forms will be provided by the laboratory that includes documentation from the laboratory that they are PFAS-free.

4.5 Field Clothing and PPE

PFAS are used to coat various clothing and PPE to repel water, oil, and dirt. While preparing for sampling, pay attention to clothing or PPE that is advertised to have waterproof, water-repellant, or dirt and/or stain resistant characteristics because these types of clothing may have had PFAS used in their manufacture and can be a source of contamination. **However, personal safety is a priority and should not be compromised to prevent cross-contamination.** Therefore, if the use of PPE is necessary to ensure the health and safety of sampling personnel and no PFAS-free alternative is available, then record the use of the PPE in the field notes and/or the chain of custody and discuss in the final report, as necessary.

There are several industry standard PPE items that may be required during sampling events that have not been evaluated for PFAS, including hard hats, safety glasses, personal floatation devices (PFDs), and uncoated Tyvek® products. If these items are used during the sampling event, then they should be screened by collecting an equipment blank prior to use. Additionally, if PPE is used and it is unknown if PFAS are used in its manufacturing, then collecting an equipment blank prior to use is recommended. For reference purposes, the below table lists examples of clothing and personal protective equipment that should and should not be used during PFAS sampling events.

Acceptable materials	Support zone materials	Prohibited materials
• Synthetic or 100% cotton clothing that has been well-laundered (without use of fabric softener) • Waterproof clothing made with polyurethane, PVC, wax-coated fabrics, rubber, or neoprene • Boots or boot covers made of polyurethane and/or PVC • Powderless nitrile gloves • Uncoated paper and ballpoint pens	• Non PFAS-free boots (e.g., steel-toed) • First-aid adhesive wrappers Note: Hands should be washed, and gloves changed after handling these products.	• Water/stain/dirt-resistant treated clothes (including but not limited to Gore-Tex™, Scotchgard™, and RUCO®) • New unwashed clothing • Clothes recently washed with fabric softeners. • Clothes chemically treated for insect resistance and ultraviolet protection. • Coated Tyvek® • Latex gloves • Treated paper (e.g., "write in the rain notebooks"), gel-based ink pens, and sharpies

4.6 Sun and Biological Protection Products

Biological hazards (UV from sun, mosquitos, ticks, etc.) are likely to be encountered during sampling, so the elimination of specific clothing materials, sunscreens and insect repellants that are known to contain PFAS may not be possible because elimination of these items could pose a health and safety hazard to field staff. While the potential for sunscreen, insect repellants, and personal products to contaminate PFAS samples, the personal safety of field staff is of top priority. Therefore, deviations from this SOP, including those necessary to ensure the health and safety of field staff, shall be recorded in field notes and/or the chain of custody and discussed in the final analytical report.

Sunscreens may be needed if field staff are subject to prolonged sun exposure. Sunscreens may have been manufactured using PFAS and can be a potential source of cross-contamination. Similarly, protection against insects may require the use of insect repellant, which also may have been manufactured with PFAS. Therefore, it is important to be aware of the sunscreen or insect repellant selected for use during a PFAS sampling events. The words "natural" and/or "organic" in a product name or used to describe the product does not mean that the product is PFAS-free. More information on sunscreens and insect repellants can be found in Michigan's PFAS Sampling Quick Reference Field Guide (https://www.michigan.gov/pfasresponse/-/media/Project/Websites/PFAS-Response/Sampling-Guidance/Sediment.pdf?rev=dd05563cab0a446c9b9975195c82c1c0). Note that this is not a comprehensive list of sunscreens or insect repellants so other products not listed may meet the requirements for use. Also, there is no guarantee that these products will remain PFAS-free.

If sunscreens or insect repellants are used during a PFAS sampling event, then the product should be applied in the staging area. Hands should be washed, and new gloves used following application.

4.7 Personal Hygiene and PCPs

Several sampling guidance documents recommend that personal hygiene and PCPs (e.g., cosmetics, shampoo, sunscreens, dental floss, etc.) not be used prior to and on the day(s) of sampling because the possible presence of PFAS in these products. However, if this SOP is followed, these items should not contact the sampling equipment, or the samples being collected. Field personnel need to be aware of the potential of cross-contamination if the sampling equipment or actual samples contacts these products. The following precautions will be taken when dealing with personal hygiene or PCPs before sampling:

- Do not handle or apply PCPs in the sampling area.
- Do not handle or apply PCPs while wearing PPE that will be present during sampling.
- Move to the staging area and remove PPE if applying personal care products becomes necessary.
- Wash hands thoroughly after the handling or application of PCPs and, when finished, put on a fresh pair of powderless nitrile gloves.

4.8 Food Packaging

PFAS are known to be prevalent in food packaging, including paper plates, aluminum foil, paper towels, food containers, bags, and wraps. Although long-chain PFAS have been banned for use in the manufacturing of contact food materials in the United States, short-chain PFAS have not been banned. Therefore, these products could be a source of PFAS contamination. If food or beverages are to be consumed during the sampling event, then a dedicated eating area should be included in the sampling site plan that is outside of the safety or work zones.

5 DECONTAMINATION

Sampling equipment must be cleaned and decontaminated prior to use to prevent cross-contamination from outside sources including the environment itself. Conventional procedures for cleaning and decontaminating sampling equipment can be used but must include a rinsing with PFAS-free water and adhere to the following decontamination guidance:

- Use of laboratory supplied PFAS-free deionized water is preferred for cleaning and decontamination.
- Commercially available deionized water may be used for cleaning and decontamination if the water is verified to be PFAS-free.
- Do not use Decon 90®.
- Alconox® and Citranox® can be used for equipment cleaning and decontamination.
- Sampling equipment can be scrubbed using a polyethylene or PVC brush to remove particulates.