ISID - Environmental (Billing Rate) Indefinite-Scope, Indefinite-Delivery Contract R 02/28/19



# STATE OF MICHIGAN

# DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

This contract authorizes the professional services contractor to provide professional services. (Authority: 1984 PA 431)

## CONTRACT FOR PROFESSIONAL ENVIRONMENTAL SERVICES: Indefinite Scope-Indefinite Delivery

THIS CONTRACT, authorized this 17th day of February the year two-thousand and twenty-three (2023), by the Director, Department of Technology, Management and Budget, BETWEEN the STATE OF MICHIGAN acting through the STATE FACILITIES ADMINISTRATION, DESIGN AND CONSTRUCTION DIVISION of the DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET, 3111 W. St. Joseph Street, Lansing, Michigan, 48917, hereinafter called the Department, and

#### WSP Engineering and Consulting of Michigan, Inc. 46850 Magellan Dr., Suite 190 Novi, MI 48377

the Prime Professional Services Contractor, hereinafter called the

Professional. WHEREAS the Department proposes securing

professional services for:

#### Indefinite-Scope, Indefinite-Delivery Contract No. 00952

Index No. (To Be Established) Contract Order No. Y (To Be Assigned) File No. (To Be Assigned)

Department of Technology, Management and Budget, State Facilities Administration, Design and Construction Division, Professional Environmental Services Indefinite-Scope, Indefinite-Delivery Contract (ISID) for Minor Projects –

#### 2023 Environmental ISID Services

Various State Departments and Facilities Various Site Locations, Michigan

NOW THEREFORE, the Department and the Professional in consideration of the covenants of this Contract agree as follows:

- The Professional shall provide primary environmental investigation/assessment/design/construction oversight services for the assigned projects to the extent authorized by the Department of Technology, Management and Budget State Facilities Administration (SFA), Design and Construction Division (DCD) [The Department] and be solely responsible for such professional services. The Professional's services shall be performed in strict accordance with the assigned Project scope of work.
- II. If authorized, the Professional shall provide environmental services for the regions and project types identified below.

Regions							
Western UP	Eastern UP	Northern LP	Saginaw Bay	Western LP	Central LP	Southwestern LP	Southeastern LP
х	х	x	х	х	х	х	х

		Ρ	rojec	t Ty	vpes a	and	Ser	vices	s Offe	ered			
Asbestos/Lead/Mold/Biohazard/Free Product Regulated Waste Survey/Abatement	Brownfield Development	Ecological Risk Assessment / Forestry and Land Management / Wetland Mitigation / Streams and Lakes Restoration	Environmental Investigation / Characterization / Pilot Tests / Feasibility Study	Environmental Roto Sonic Drilling / Well Abandonment	Ground Penetrating Radar (GPR) / Laser-Induced Fluorescence (LIF) Field Screening	Landfill Maintenance / Monitoring	Nuclear Waste Management / Disposal / Remediation	Per-& Polyfluoroalkyl Substances (PFAS) Sampling / Mitigation / Remediation	Phase I / Phase II / Baseline Environmental Assessments	Remediation Systems Design / Construction Oversight / O & M / Decommissioning	Specialty Sub-Surface / Utility Inspection / Sewer Camera / Cleaning	Underground / Aboveground Storage Tank (UST / AST) Removal / Demolition/ Soil Excavation / Closure	Vapor Intrusion Assessments / Risk Mitigation / Design / Installation / O & M Services
X	X	Х	X	X	X	X	X	X	X	X	X	X	X

NOTE: Blackened box(es) indicate a service that the committee did not select for your firm.

III. The State of Michigan shall compensate the Professional for providing their professional services for the Project in accordance with the conditions of this Professional Services Contract. IN WITNESS, WHEREOF, each of the parties has caused this Professional Services Contract to be executed by its duly authorized representatives on the dates shown beside their respective signatures, with the Contract to be effective upon the date on which the Professional received a copy executed by the authorized State of Michigan representative(s) by regular, registered, or certified mail or by delivery in person.

#### FOR THE PROFESSIONAL:

WSP Engineering and Consulting of Michigan, Inc.	CV005901			
Firm Name	SIGMA Vendor ID Number			
groupprody	03/16/2023			
Signature	Date			
Program Manager				
Title				
FOR THE STATE OF MICHIGAN:				
adu Harl	March 20, 2023			
Director, DTMB   SFA   Design and Construction	Date			

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WHEREAS this Professional Services Contract constitutes the entire agreement as to the Project between the parties, any Contract Modification of this Contract and the Department's approved and attached Project/Program Statement scope of work requirements must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the State may require. No Contract Modification may be entered into to compensate the Professional for correcting, or for responding to Professional design claims or litigation for. the firm's final Contract Documents/architectural and engineering design errors, omissions, or neglect on the part of the Professional.

#### ARTICLE I PROFESSIONAL SERVICES SCOPE OF WORK

Provide professional environmental services, technical staff, and support personnel for ISID minor projects on an as-needed basis at various State/Client Agencies within the various site location areas as defined by the State of Michigan.

This Contract is for professional environmental investigation and/or design services for an unspecified number of ISID projects ("Assignment"). The scope of work for each assigned project will be defined at the time the project is awarded by the State to the Professional firm. The professional environmental services required for each of these assigned projects requested by the Department may include any or all of the Tasks included in the Phase 100 – Study through the Phase 900 – Operation and Maintenance Management.

The Professional firm's environmental services shall be performed in strict accordance with this Professional Services Contract and be in compliance with the Department's approved and attached Appendix I– Project/Program Statement.

This Contract does not warrant or imply to the Professional environmental firm, entitlement to perform any specific percentage (%) amount of environmental work during the life of this Contract.

This Contract will remain in effect for **three (3) years** from the date of this Contract award but may be unilaterally terminated by the State of Michigan at any time, for cause or its convenience, by written notification of the State, to the Professional. Furthermore, this Contract may be extended for **one (1) additional year**, at the sole option and discretion of the State upon the Department providing written notice to the Professional prior to the expiration of the original Contract time period. Any such time extension shall be subject to the terms and conditions of this Contract, including, but not limited to, the existing hourly billing rates included in this Contract for the Professional, their Consultant, and their employees or agents.

Please note that the Professional Services Contract ISID Contract No., as noted on page 1, must be provided on all Project correspondence and documents. Also, services are not to be provided or expenses incurred until individual ISID Projects are assigned to this Contract (see the Article II – Compensation and the Appendix 1 – Project/Program Statement).

Upon award of this Contract and each subsequent assignment, the Professional understands and agrees that time is of the essence. Failure to adhere to timely completion will be grounds for the Department, at its sole discretion, to terminate or limit future work under this Contract.

The Professional shall provide all professional services, technical staff, and support personnel necessary to complete the Project as described in its Project/Program Statement, in the best interest of the State, and within the Professional's fee(s) herein authorized by the State. Assigned project services shall comprise, without exception, every professional discipline and expertise necessary to meet all the requirements as described in the Project/Program Statement and in accordance with the accepted industry standards for professional practice and services. The Professional's services include attendance at all Project related meetings and conferences. Professional services for the assigned projects under this contract shall be provided in the Phase/Task sequence shown below and shall be rendered in accordance with the Professional's proposed and approved Project Study, Design, and Proposed Construction Schedule. The Professional's study, design, and proposed construction schedule shall be detailed, undated, and time sequence related for all Phase/Task services appropriate for the Project. The Professional shall field-check and verify the accuracy of all study/drawing and any data furnished by the Department, the State/Client Agency or any other Project related source. The Professional shall not employ or consult with any firms in completing the Professional's obligations herein who it anticipates will be a construction Bidder for the Project or any part thereof, unless specifically authorized, in writing, by the Department.

The Professional acknowledges that the Department is the first interpreter of the Professional's performance under this Contract.

The Professional acknowledges by signing this Professional Services Contract having a clear understanding of the requested professional environmental services required by the Department, and further agrees that the terms and conditions of this Professional Services Contract provide adequate professional fee(s) for the Professional to provide the requested Project scope of work requirements for each assigned project. No increase in compensation to the Professional will be allowed unless there is a material change made to the scope of work of the Assignment/Program Statement and the change is accepted and approved, in writing, by the State. Professional services shall not be performed, and no Project expenses shall be incurred by the Professional prior to the issuance of a written and signed Professional Services Contract and a Contract Order authorizing the Professional to start the Project work. Compensation for Department directed changes to the Project will be provided to the Professional by a Contract Modification and/or Contract Change Order signed by the Department and the Professional. The preparation of Bulletins and Contract Change Orders resulting from changes in the Project scope of work or previously unknown on-site field conditions will be compensated to the Professional, as approved by the Project Director/Agency Project Manager, on an hourly billing rate basis in accordance with this article. This compensation shall not exceed seven and half percent (7.5%) of the Construction Contractor's quotation for the Bulletin or Contract Change Order or an amount mutually agreed upon by the Professional and the Project Director/Agency Project Manager.

The Professional shall immediately inform the Department whenever it is indicated that the Professional's authorized not-to-exceed Budget for any of the assigned Projects may be exceeded. The Professional shall make recommendations to the Department for revisions to be implemented in order to not exceed the original authorized Budget. Any revision to the Project must be accepted and approved by the Department in writing.

The professional services may also include participation in legislative presentations as described in the "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" and as the legislature or the Department may prescribe.

No substitution of any "Key Personnel/Employee" essential for the successful completion of the Project and identified in the Professional's Organizational Chart will be allowed by the Professional for this Contract without the prior written consent from the Project Director/Agency Project Manager. Before any "Key Personnel/Employee" substitution takes place, the Professional shall submit a written request to the Project Director/Agency Project Manager, and this substitution request shall include the following information: (1) A request in writing for a No Cost Contract Modification; (2) Detailed written justification for this substitution; (3) The Professional's qualifications of any proposed "Key Principal Personnel/Employee" replacement; and (4) A written statement from the Professional assuring the Department that the Project scope of work will not be adversely affected by this substitution. This request to modify their Professional Services Contract must be accepted and approved in writing by the Project Director/Agency Project Manager and the Director of the Department.

The Department will designate individuals to serve as the Project Director and Agency Project Manager for the Project scope of work who shall be fully acquainted with the Project/Program Statement and have the authority to render Project decisions and furnish information promptly. Except in connection with issues under the Article XII - Contract Claims and Disputes text, the Project Director/Agency Project Manager will exercise general management and administration for the Professional's services in so far as they affect the interest of the State. The Professional shall indemnify, defend, and hold harmless the State against exposure to claims arising from delays, negligence, or delinquencies by the Professional for the professional services of this Contract.

During the Construction Administration Services Phase of the Project, the Professional is required to complete and submit, the on-site inspection record form, "DTMB-0452, The Professional's Inspection Record," for all on-site inspection visits to the Project site. The Inspection Record shall be completed and signed by the Professional and submitted monthly, with the original document sent to the Project Director/Agency Project Manager and copies sent to the Construction Contractor. The Inspection Record shall accompany the Professional's monthly payment request.

The "DTMB-0460, Project Procedures" contains Department forms which shall be used during the Construction Administration Phase of this Contract. All professional services will be consistent with the Department's current "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" unless otherwise approved in writing by the Department.

The professional services required for each Phase of this Contract shall be performed by the Prime Professional and their Consultants in accordance with service descriptions in this article. The following service descriptions outlined in this Contract represent the Department's standard of care for the Professional's responsibilities for providing the professional services of this Contract; but by inclusion, or omission, the descriptions do not limit or exclude any regular or normal professional services necessary to accomplish the Project in accordance with the approved Project Budget and the industries accepted practice and standards for professional services. All of the services outlined in this Contract may not be applicable to the Project/Program Statement. The Professional shall determine and coordinate the interface of the services required for the Project and is responsible for identifying any additional services necessary to successfully complete the Project.

The professional shall execute the following PHASES upon written authorization from the Project Director.

#### PHASE 100 - ENVIRONMENTAL INVESTIGATION/STUDY SERVICES

Provide complete and comprehensive Environmental Investigation/Study Deliverables to meet the requirements of the Project/Program Statement. Upon completion of all field investigation, assessment, research, review and/or oversight, prepare a complete report with an executive summary, and in such detail, as the Project Director may prescribe. The services under this phase may include but not be limited to coordination, environmental assessments, drilling, field sampling/oversight, data/document review/management, feasibility study, and reporting as described in the Project/Program Statement. Project reports must be in accordance with Department/Client/Agency requirements and as outlined in the Project/Program Statement but shall include, as a minimum and as appropriate, the following items: (1) Problem; (2) Conclusion; (3) Recommendations; and (4) Discussion, details, and documentation.

#### PHASE 300—SCHEMATIC DESIGN

Prepare Schematic Design Deliverables consistent with the Project/Program Statement. The deliverables shall consist of conceptual remediation system, drawings, outline specifications, a Schematic Construction Cost Estimate, other related documentation, and shall diagrammatically depict the areas, scales, and relationships of the functions. The services under this phase may include but not be limited to coordination, construction codes and design reviews, civil/site staging investigation, schematic design and utilities review, drafting, and project cost/proposed construction schedule, as required by the Department/Client/Agency and as outlined in the Project/Program Statement. Acceptance of the Schematic Design by the Department/Client/Agency does not limit subsequent inclusion of minor, but essential, schematic or design details whose necessity and arrangement may best become apparent during subsequent Phases of the Project design. Revise design as necessary and obtain approval from the Department/Client/Agency.

#### PHASE 400-DESIGN DEVELOPMENT

Prepare Design Development Deliverables based on the Owner-accepted Schematic Design to depict the intent of the designed remediation system(s). The deliverables shall consist of draft drawings and specifications. Construction Cost Estimates and other related documentation to clearly establish the complete basis for further detail into final design drawings/specifications. The deliverables shall further define the Project by fixing and describing the Project size, character, site relationships, and other appropriate elements including the environmental, civil, structural, architectural, mechanical, electrical, and safety systems. The services under this phase may include but not be limited to coordination, draft drawings/specifications, site specific staging investigation, structural calculations and preliminary environmental/architectural/engineering design drawings/specifications, development/reviews of as required by the Department/Client/Agency and as outlined in the Project/Program Statement.

#### PHASE 500-CONSTRUCTION DOCUMENTS AND BIDDING DOCUMENTS

Prepare Construction Documents that revise, refine, amplify, and depict, in detail, the Project. The documents shall set forth, in detail, guality levels of and requirements for the construction, and shall consist of final drawings/specifications that comply with applicable regulatory and construction code requirements, enacted at the time of completion of the one hundred percent (100%) Construction Documents. Prepare Bidding Documents in Phases/Bid packages appropriate to the Project requirements and funding. Incorporate the current edition of DTMB "MICHSPEC", "DCSPEC" or "50KSPEC", as adopted and modified by the State of Michigan. The Construction Documents shall contain all information necessary to bid and construct the Project. The services under this phase may include but not be limited to coordination, final drawings/specifications and bidding documents, civil/site staging design, final structural calculations, final environmental/architectural/engineering design development/reviews of drawings/specifications, construction testing program, hazardous materials, health and safety risks, final design correction procedures, design and construction budget, construction codes/permits and construction schedule, as required by the Department/Client/Agency and as outlined in the Project/Program Statement.

#### PHASE 600 - CONSTRUCTION ADMINISTRATION - OFFICE SERVICES

Provide all required construction oversight administration and timely professional review and administrative services, as the circumstances of the Construction may require, allowing the successful review/implementation of the Construction Documents into a completed remedial actions/abatement measures and/or for the use intended by the Department/Client/Agency. The services under this phase may include but not be limited to coordination, review and approval of shop drawings and submittals, reporting of construction progress, construction quality testing, construction contractor performance review, punch list procedures, claims, establishing close-out procedures and developing/review of as-built documents, as required by the Department/Client/Agency requirements and as outlined in the Project/Program Statement.

#### PHASE 700 - CONSTRUCTION ADMINISTRATION - FIELD SERVICES

Provide all required Construction Oversight and Field Services, including timely inspection and professional services, as the circumstances of the Construction may require, allowing the successful review/implementation of the Construction Documents into a completed remedial action/abatement measures and/or for the use intended by the Department/Client/Agency. The services under this phase may include but not be limited to coordination, field inspections, progress meetings and final project inspection, as required by the Department/Client/Agency requirements and as outlined in the Project/Program Statement.

#### PHASE 900 - OPERATION AND MAINTENANCE SERVICES - REMEDIATION FACILITY

Provide all required Operation and Maintenance (O&M) Services and perform, in a safe and secure environment, all functions, including timely inspection, sampling and professional services, necessary to maintain uninterrupted, effective and efficient facility/system components for the use intended by the Department/Client/Agency. The services under this phase may include but not be limited to coordination, general system operation/inspections, routine system/building/ground maintenance, sampling, spare consumable supplies, replacement parts, utilities. waste materials removal/treatment/disposal, non-routine emergency services, progress meetings and reporting, as required by the Department/Client/Agency requirements and as outlined in the Project/Program Statement.

## ARTICLE II COMPENSATION

In consideration of the performance of this Contract, the Department agrees to pay the Professional, as compensation for professional services, an hourly billing rate for each employee providing a direct service to this Project, on a not-to-exceed basis as specified herein, subject to subsequent modifications mutually agreeable to the parties hereto; provided, however, the Professional may not incur costs, or bill the Department, for professional services in excess of the estimates established for this Project without the prior written agreement of the Department. The attached proposal prepared by the Professional in response to the Request for Proposal, by the Owner, may describe methodology, services, schedule, and other aspects of the work to be performed under the Contract but does not supersede the Contract.

Compensation to the Professional shall be on an hourly billing rate basis for professional services rendered by salaried and non-salaried professional, technical, and technical support employees, except for any authorized reimbursable expenses provided for in this Contract. Total compensation for any Phase shall not exceed the amount authorized for that Phase, unless authorized in writing by the Department's approved Contract Change Order. Professional services shall not be performed, and no Project expense shall be incurred by the Professional firm prior to the issuance of a written and signed Professional Services Contract and a DTMB Form 0402 - Contract Order by the Department to the Professional, authorizing the Professional to start the Project.

Compensation to the Professional for services and authorized technical and technical support employees performing a direct service for this Project shall be determined using the Professional firm's billing rates. The Professional firm's hourly billing rate shall be the actual amount paid for the employee services on the Project including fringe benefits, vacations, sick leave, other indirect costs, and profit. The Professional firm's hourly billing rates shall not change during the life of this Contract without written approval by the Department. See attached Appendix, **Overhead Items Allowed for the Professional Services Contractor Firm's Hourly Billing Rate Calculation**, for the guide to overhead items allowed for the professional services contractor firm's hourly billing rate calculation. Reimbursement for the Project/Program Statement scope of work requirements will be provided only for Department approved items authorized for reimbursement compensation in this Contract. The State will not reimburse the Professional for downtime, or for personnel involved in downtime due to mechanical problems or failure of Professional's or Subcontractor equipment.

The preparation of Bulletins and Contract Change Orders resulting from changes to the Project scope of work or previously unknown on-site field conditions will be compensated to the Professional, as approved by the Department on an hourly billing rate basis in accordance with this article. This compensation shall not exceed seven and one- half percent (7.5%) of the Construction Contractor's quotation for the Bulletin or Contract Change Order or an amount mutually agreed upon by the Professional and the Project Director/Agency Project Manager.

The Professional shall provide, but no additional monetary compensation shall be allowed for the services necessary to respond to and resolve all claims arising wholly or in part from the Professional's errors and/or omissions or other aspects of the Project's design or the Professional firm's performance which is inconsistent with the Professional or Construction Contract.

- 2.1 PREMIUM TIME/OVERTIME: This Contract anticipates that no premium or overtime is required to achieve the Project's scope of work. No compensation will be allowed to the Professional for any premium or overtime cost incurred to achieve the Project schedule of this Contract, unless directed in writing by the Project Director/Agency Project Manager and approved by the Department.
- 2.2 EMPLOYEE HOURLY BILLING RATES: Hourly billing rates will include all direct and indirect monetary costs to the State for the Professional's services under this Contract other than the authorized and approved reimbursements. Hourly billing rates shall be based on the Professional's documented historical operating expenses and adjusted for Project specific costs. In no case shall this documentation period include more than eighteen (18) months prior to the date of award of this Contract.

Lump-sum payments to employees are not allowed under this Contract. Billing rates for employees who perform professional services of a subordinate or of a position classification having a lower classification/pay range shall be accounted and paid for at the lower hourly billing pay rate. The hourly billing rate charge of any employee may be changed by the Professional with a written and Department approved Contract Modification to account for normal personnel pay increases. Hourly billing rates include, but are not limited to: Overhead items such as employee fringe benefits, vacations, sick leave, insurance, taxes, pension funds, retirement plans, meals, lodging, and all Project related travel expenses for Projects <u>less than</u> one-hundred (100) miles in each direction from the Professional's nearest Michigan office, computer costs/operating costs, data entry, and time, telephone, telephone- related services, and all reproduction services (except Contract Bidding Documents/Deliverables).

The hourly billing rate also includes all reproduction costs for design interpretations, study/design clarifications and Bulletins related to design errors or omissions, construction code compliance (precipitating either from design code compliance and plan review, design interpretations, or construction on-site/field inspections), and all similar, or avoidable costs.

All incidental postage, mail, or other shipping or delivery services, acquisition, bad debts, previous business losses, employment fees, depreciation, and operating costs for equipment, including computer design and/or computer drafting systems, and any specialized testing equipment are to be included. The hourly rate include, without exception. billina shall secretarial. computer/typing/word processing, editing, and clerical services utilized in any way for the Project as well as other non-technical and/or employees providing indirect services. The hourly billing rate also includes all profit without regard to its form or distribution.

Items not allowable as part of the Professional's calculated hourly billing rate include but are not limited to: Any costs associated with litigation and settlements for the Professional, other liability suits, out-of-state offices and associated travel, bonuses, profit sharing, premium/overtime costs, public relations, entertainment, business promotion, contributions, and various speculative allowances.

The hourly billing rate for the Professional may not be applied to the work of the Professional's Sub- Consultant's staff. Each Sub-Consultant firm must submit a separate hourly billing rate with proper documentation for Sub-Consultant services provided as part of the Proposal. The hourly billing rate of the respective Consultant firm shall be used for that Consultant firm's personnel only. No mark-up to Consultant firm's charges will be allowed.

2.3 RANGE OF EMPLOYEE HOURLY BILLING RATES: The Professional shall identify the service being provided and include the Professional's or Consultant's employee(s) full names and position classifications for the Project and their current hourly billing rates at the beginning and at the anticipated end of the Project. This hourly billing rate range shall reflect any anticipated pay increases over the life of the Contract. The range of hourly billing rates for any employee position or classification may not be changed without an approved Contract Modification.

2.4 DIRECT COST REIMBURSEMENT ITEMS: The Professional's Consultant services and authorized reimbursable expenses shall be treated as an authorized reimbursable expense item at a direct cost. The Professional shall be responsible for the selection of the supplier of the professional services or materials; the coordination, adequacy, and application of the professional services, whether provided by the Professional's staff or provided by their Consultant, and any Project costs that exceed the budget for each Phase.

Project related travel expenses (mileage, meals, lodging) for Projects <u>more than</u> onehundred (100) miles in one- way from the Professional's nearest office shall be treated as an authorized reimbursable expense at the State of Michigan's current travel rates.

Unless authorized elsewhere in this Contract, direct cost reimbursement items shall be limited to the actual cost of printing and reproduction of project deliverables such as Final Study Reports, Surveys, Bidding Documents, and U. S. Mail regular shipping postage of the project deliverables listed above. In addition, direct cost reimbursement items may include soil borings, site surveys and any required laboratory testing, Design Code Compliance and Plan Review Approval Fees by the licensing agency; reproduction of documents for legislative presentation, artistic productions, mobilization of testing equipment, laboratory costs for testing samples, per-linear-foot cost of soil borings and specialized inspections of the structural, mechanical, electrical, chemical or other essential components of the Project.

Compensation for this Contract shall not exceed the budget per Project Phase identified in the attached Contract Order unless authorized by a Department approved Contract Modification. It shall be the Professional's responsibility to carefully monitor Project costs, activities, and progress and to provide the Project Director/Agency Project Manager timely notification of any justifiable need to increase the authorized budget. The Professional may not proceed with professional services that have not been authorized by the Project Director/Agency Project Manager and shall immediately notify the Project Director/Agency Project Manager if such services have been requested or have become necessary.

Professional/Sub-Consultant staff and hourly billable rates are identified in the attached Professional's proposal.

## ARTICLE III PAYMENTS

Payment for the professional services shall be based on the Professional's performance of authorized professional service(s) performed prior to the date of each submitted payment request. Payment requests shall be submitted monthly to the Project Director/Agency Project Manager on a payment request form (DTMB-440). Payment for each monthly submitted payment request shall be made within thirty (30) consecutive calendar days following the Department's approval of the payment request. Payment requests shall include signed certification by the Professional of the actual percentage of work completed as of the date of invoicing for each Phase and summarize the amounts authorized, earned, previously paid, and currently due for each Project Phase. Payment requests shall be supported by itemized records or documentation in such form and detail as the Department may require.

Each of the Professional's Consultant's submitted payment request applications shall include similar information. This includes, but is not limited to:

- Phase Numbers for the professional services provided.
- Professional's personnel and position/classification providing service and hours worked. Current hourly billing rate charges for each individual position/classification.
- Copy of certified on-site visitation log or site visit report showing time on-site.
- Itemized invoices from each of the Professional's Consultant's documenting that firm's professional services charge and the Project work related services provided.
- Authorized reimbursable expense items provided with receipts and invoices.

The State has the right to withhold payment of any disputed amounts until the parties agree as to the validity of the disputed amount. The State will notify the Professional of any dispute within a reasonable time. Payment by the State will not constitute a waiver of any rights as to the Professional's continuing obligations, including claims for deficiencies or substandard Contract Activities. The Professional's acceptance of final payment by the State constitutes a waiver of all claims by the Professional against the State for payment under this Contract, other than those claims previously filed in writing on a timely basis and still disputed.

The State will only disburse payments under the Contract through Electronic Funds Transfer (EFT). Contractor must register with the State at to receive electronic funds transfer payments. If Contractor does not register, the State is not liable for failure to provide payment.

Without prejudice to any other right or remedy if may have, the State reserves the right to set off at any time any amount then due and owing to it by Contractor against any amount payable by the State to Contractor under this Contract

## ARTICLE IV ACCOUNTING

The Professional shall keep current and accurate records of Project costs and expenses, hourly billing rates, authorized reimbursable expense items, and all other Project related accounting documents to support the Professional's monthly application for payment. Project records shall be kept on a generally recognized accounting basis. Such records shall be available to the Department for a period of ten (10) years after the Department's final payment to the Professional. The State of Michigan reserves the right to conduct, or have conducted, an audit and inspection of these Project records at any time during the Project or following its completion.

## ARTICLE V INSURANCE

The Professional shall purchase, maintain and require such insurance that will provide protection from claims set forth below which may arise out of or result from the Professional firm's services under this Contract, whether such service is performed by the Professional or performed by any of the Professional firm's Consultant's or by anyone directly or indirectly employed by them, or by anyone for whose acts they may be liable. The following insurance policy limits described below are intended to be the minimum coverage acceptable by the State:

For the purpose of this Section, "State" includes its departments, divisions, agencies, offices, commissions, officers, employees, and agents.

- (a) The Contractor must provide proof that it has obtained the minimum levels of insurance coverage indicated or required by law, whichever is greater. The insurance must protect the State from claims that may arise out of or result from or are alleged to arise out of or result from the Contractor's or a Subcontractor's performance, including any person directly or indirectly employed by the Contractor or a Subcontractor, or any person for whose acts the Contractor or a Subcontractor may be liable.
- (b) The Contractor waives all rights against the State for the recovery of damages that are covered by the insurance policies the Contractor is required to maintain under this Section. The Contractor's failure to obtain and maintain the required insurance will not limit this waiver.
- (c) All insurance coverage provided relative to this Contract is primary and noncontributing to any comparable liability insurance (including self-insurance) carried by the State.
- (d) The State, in its sole discretion, may approve the use of a fully-funded selfinsurance program in place of any specified insurance identified in this Section.
- (e) Unless the State approves, any insurer must have an A.M. Best rating of "A" or better and a financial size of VII or better, or if those ratings are not available, a comparable rating from an insurance rating agency approved by the State. All policies of insurance must be issued by companies that have been approved to do business in the State. To view the latest A.M. Best's Key Ratings Guide and the A.M. Best's Company Reports (which include the A.M. Best's Ratings) visit the A.M. Best Company internet web site at <u>http://www.ambest.com</u>.
- (f) Where specific coverage limits are listed in this Section, they represent the minimum acceptable limits. If the Contractor's policy contains higher limits, the State is entitled to coverage to the extent of the higher limits.

- (g) The Contractor must maintain all required insurance coverage throughout the term of this Contract and any extensions. However, in the case of claims-made Commercial General Liability policies, the Contractor must secure tail coverage for at least three (3) years following the termination of this Contract.
- (h) The minimum limits of coverage specified are not intended and may not be construed; to limit any liability or indemnity of the Contractor to any indemnified party or other persons.
- (i) The Contractor is responsible for the payment of all deductibles.
- (j) If the Contractor fails to pay any premium for a required insurance policy, or if any insurer cancels or significantly reduces any required insurance without the State's approval, the State may, after giving the Contractor at least 30 days' notice, pay the premium or procure similar insurance coverage from another company or companies. The State may deduct any part of the cost from any payment due the Contractor or require the Contractor to pay that cost upon demand.
- (k) In the event the State approves the representation of the State by the insurer's attorney, the attorney may be required to be designated as a Special Assistant Attorney General by the Michigan Attorney General.

The Professional firm's Errors and Omissions coverage shall include coverage for claims resulting from acts of forbearance that cause or exacerbate pollution and claims of bodily injury and property damage in the amount of \$1,000,000 minimum coverage per occurrence, \$3,000,000 annual aggregate. This insurance is required of all professional firms who conduct professional environmental services including, but not limited to, any of the following services:

- (i) Remedial System Design.
- (ii) Remediation Management.
- (iii) Feasibility Development and Implementation.
- (iv) Hydrogeological Evaluation.
- (v) Media Testing and Analysis.
- (vi) Subsurface and Geophysical Investigation.
- (vii) Other related activities as determined by the Department.

Required Limits	Additional Requirements				
Commercial General L	iability Insurance				
Minimum Limits: \$1,000,000 Each Occurrence Limit \$1,000,000 Personal & Advertising Injury Limit \$2,000,000 General Aggregate Limit \$2,000,000 Products/Completed Operations	Professional must have their policy endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds using endorsement CG 20 10 11 85, or both CG 20 10 12 19 and CG 20 37 12 19.				
Umbrella or Excess	Liability Insurance				
Minimum Limits: \$2,000,000 General Aggregate	Professional must have their policy follow form.				
Automobile Liabi	lity Insurance				
<u>Minimum Limits:</u> \$1,000,000 Per Accident	Professional must have their policy: (1) endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds; and (2) include Hired and Non-Owned Automobile coverage.				
Workers' Compensation Insurance					
Minimum Limits: Coverage according to applicable laws governing work activities.	Waiver of subrogation, except where waiver is prohibited by law.				
Minimum Limits: \$500,000 Each Accident \$500,000 Each Employee by Disease \$500,000 Aggregate Disease.					
Professional Liability (Er Insurar	rors and Omissions) ice				
Minimum Limits: \$1,000,000 Each Occurrence \$2,000,000 Annual Aggregate <u>Deductible Maximum:</u> \$50,000 Per Loss					

Environmental and Pollution Liability (Errors and Omissions) ***					
<u>Minimum Limits:</u> \$1,000,000 Each Occurrence \$2,000,000 Annual Aggregate	Professional must have their policy: (1) be applicable to the work being performed, including completed operations equal to or exceeding statute of repose; (2) not have exclusions or limitations related to Transportation (upset overturn, spills during loading or unloading, Hazardous Materials Handling, and Non-Owned disposal site liability; and (3) endorsed to add "the State of Michigan, its departments, division, agencies, offices, commissions, officers, employees, and agents" as additional insured.				

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Contractual Liability insurance for claims for damages that may arise from the Professional's assumption of liability on behalf of the State under Article VI concerning indemnification for errors, omissions, or negligent acts in the course of the professional service or other provision within this Contract to the extent that such kinds of contractual liability are insurable in connection with and subject to limits of liability not less than for the general liability insurance and the professional liability insurance and set forth in subsections (c) and (d) above.

Except where the State has approved a subcontract with other insurance provisions, the Professional must require any Consultant/Subcontractor to purchase and maintain the insurance coverage required in this Article. Alternatively, the Contractor may include a Consultant/Subcontractor under the Professional's insurance on the coverage required in that Section. The failure of a Consultant/Subcontractor to comply with insurance requirements does not limit the Professional's liability or responsibility.

Certificate of Insurance documents, acceptable to the State, shall be provided and filed with the Department prior to commencement of the Professional's Project services, unless otherwise approved in writing, and not less than 20 days before the insurance expiration date every year thereafter. Facsimile copies of the Certificate of Insurance will not be accepted. Certificate of Insurance documents must be either submitted hard copy or portable document file (.pdf). The Certificate of Insurance documents must specify on certificate rectangle labeled "Description the in the oblong space of Operations/Locations/Vehicles/Exclusions Added By Endorsement/Special Provisions/Special Items" the following items: (1) The ISID Title; (2) The ISID Contract Number; and (3) The State of Michigan must be named as an "Additional Insured on the General Liability and Automobile Insurance Policy." The Certificate of Insurance documents shall contain a provision that the Project insurance coverage afforded under the insurance policies for this Contract will not be modified or canceled without at least thirty (30) consecutive calendar days prior written notice, except for 10 days for non-payment of premium, to the State of Michigan, Department.

This Section is not intended to and is not to be construed in any manner as waiving, restricting, or limiting the liability of either party for any obligations under this Contract (including any provisions hereof requiring Professional to indemnify, defend and hold harmless the State).

The attached, Certificates of Insurance documents required for this Project shall be in force for this Project until the final payment by the State to the Professional is made and shall be written for not less than any limits of liability specified above. The Professional has the responsibility for having their consultant firms comply with these insurance requirements.

# ARTICLE VI

- (a) To the extent permitted by law, the Professional shall indemnify, defend and hold harmless the State from liability, including all claims and losses, and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest, and penalties), accruing or resulting to any person, firm or corporation that may be injured or damaged by the Professional in the performance of this Contract and that are attributable to the negligence or tortious acts of the Professional or any of its Subcontractors/Consultants, or by anyone else for whose acts any of them maybe liable.
- (b) Employee Indemnification: In any and all claims against the State of Michigan, its departments, divisions, agencies, boards, sections, commissions, officers, employees and agents, by any employee of the Professional or any of its Subcontractors/Consultants, the indemnification obligation under this Contract shall not be limited in any way by the amount or type of damages, compensation or benefits payable by or for the Professional or any of its Subcontractors/Consultants under worker's disability compensation acts, disability benefit acts or other employee benefit acts. This indemnification clause is intended to be comprehensive. Any overlap in provisions, or the fact that greater specificity is provided as to some categories of risk, is not intended to limit the scope of indemnification under any other provisions.
- (c) Patent/Copyright Infringement Indemnification: To the extent permitted by law, the Professional shall indemnify, defend and hold harmless the State from and against all losses, liabilities, damages (including taxes), and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest, and penalties) incurred in connection with any action or proceeding threatened or brought against the State to the extent that such action or proceeding is based on a claim that any piece of equipment, software, commodity or service supplied by the Professional or its Subcontractors/Consultants, or the operation of such equipment, software, commodity or service, or the use of reproduction of any documentation provided with such equipment, software, commodity or service infringes any United States patent, copyright, trademark or trade secret of any person or entity, which is enforceable under the laws of the United States.

In addition, should the equipment, software, commodity, or services, or its operation, become or in the State's or Professional's opinion be likely to become the subject of a claim of infringement, the Professional shall at the Professional's sole expense (i) procure for the State the right to continue using the equipment, software, commodity or service or, if such option is not reasonably available to the Professional, (ii) replace or modify to the State's satisfaction the same with equipment, software, commodity or service of equivalent function and performance so that it becomes non-infringing, or, if such option is not reasonably available to Professional, (iii) accept its return by the State with appropriate credits to the State against the Professional's charges and reimburse the State for any losses or costs incurred as a consequence of the State ceasing its use and returning it.

Notwithstanding the foregoing, the Professional shall have no obligation to indemnify or defend the State for, or to pay any costs, damages or attorneys' fees related to, any claim based upon (i) equipment developed based on written specifications of the State; or (ii) use of the equipment in a configuration other than implemented or approved in writing by the Professional, including, but not limited to, any modification of the equipment by the State; or (iii) the combination, operation, or use of the equipment with equipment or software not supplied by the Professional under this Contract.

#### ARTICLE VII OWNERSHIP OF DOCUMENTS

All Project deliverables, including but not limited to: reports, Bidding Documents, Contract Documents, electronic documents and data, and other Project related documents, including the copyrights, prepared and furnished by the Professional shall become the property of the State of Michigan upon completion of the Project, completion and acceptance of the professional's work, or upon termination of the Contract. Project deliverables shall be delivered to the Department upon their request. The Professional shall have no claim for further employment or additional compensation as a result of this Contract requirement. The Professional may retain a copy of all Project documents for their files.

If the Professional is in default or breach of its obligations under this Contract, the State shall have full ownership rights of the Project deliverables, including Bidding Documents and Contract Documents, including all electronic data. If the Professional is in default or this Contract Agreement is terminated, the State shall not use the Contract Documents and deliverables of this Contract for completion of the Project by others without the involvement of other qualified Professionals who shall assume the professional obligations and liability for the Project work not completed by the Professional.

To the fullest extent allowed by law, the State releases the Professional, the Professionals Consultant(s) and the agents and employees of any of them from and against legal claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of the State's use of the Contract Documents other than in accordance with this Contract Agreement.

All Contract deliverables listed may be published or issued for informational purposes without additional compensation to the Professional. The Professional may not use any of the Contract Documents and Contract deliverables for any purpose that may misrepresent the professional services they provided.

The Professional shall retain full rights to the Contract Documents and deliverables and the right to reuse component information contained in them in the normal course of the Professional's professional activities.

The Contract deliverables, Contract Documents, or other documents produced under this Contract may be used by the Department, or others employed by the Department or State of Michigan, for reference in any completion, correction, remodeling, renovation, reconstruction, alteration, modification of or addition to the Project, without monetary compensation to the Professional.

The State of Michigan will not construct additional Projects or buildings based on the work of this Contract without notice to the Professional. Whenever renderings, photographs of renderings, photographs or models, or photographs of the Project are released by the State of Michigan for publicity, proper credit for design shall be given to the Professional, provided the giving of such credit is without cost to the State of Michigan.

#### ARTICLE VIII TERMINATION

The State may, by written notice to the Professional, terminate this Contract and/or any Assignments, in whole or in part at any time, either for the State's convenience or because of the failure of the Professional to fulfill their Contract obligations. Upon receipt of such notice, the Professional shall:

- a) Immediately discontinue all professional services affected (unless the notice directs otherwise), and
- b) Deliver to the State all data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by the Professional in performing this Contract, whether completed or in process.
- 8.1 If the termination is for the convenience of the State, an equitable adjustment in the Contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed professional services.
- 8.2 If the termination is due to the failure of the Professional to fulfill their Contract obligations, the State may take over the work and prosecute the same to completion by Contract or otherwise. In such case, the Professional shall be liable to the State for any additional cost occasioned to the State thereby.

- 8.3 If, after notice of termination for failure to fulfill Contract obligations, it is determined that the Professional had not so failed, the termination shall be deemed to have been affected for the convenience of the State. In such event, adjustment in the Contract price shall be made as provided in Section 8.1 of this article.
- 8.4 The rights and remedies of the State provided in this article are in addition to any other rights and remedies provided by law or under this Contract.

## ARTICLE IX SUCCESSORS AND ASSIGNS

This Contract shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns; provided, however, that neither of the parties hereto shall assign this Contract without the prior written consent of the other.

## ARTICLE X GOVERNING LAWS

This Contract shall be construed in accordance with the current laws of the State of Michigan. Some Assignments to this Contract will be funded wholly or in part by the Federal Government through grant agreements and/or federal programs. The Professional must comply with such funding requirements along with any current applicable federal regulations in performing the tasks described in the Scope of Work, including but not limited to the following current federal regulations. The absence of reference to any law or regulation does not preclude its applicability to this Contract.

- 1. The Comprehensive Environmental Response Compensation and Liability Act of 1980 as amended CERCLA (The Superfund Act);
- 2. Section 306 of the Clean Air Act (42 U.S.C. 1857 (h));
- 3. Section 508 of the Clean Water Act (33 U.S.C. 1368);
- 4. Public Law 98-473 as implemented in the Department of the Interior, Bureau of Indian Affairs;
- 5. Executive Order 11738; Office of Management and Budget Circular A-87, "Cost Principles for State, Local, and Indian Tribal Governments."
- 6. 25 CFR Part 20; Financial Assistance and Social Services Programs
- 7. 40 CFR Part 31; Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments
- 8. 40 CFR Part 32 Subpart F; Drug-Free Workplace
- 9. 40 CFR Part 33; Participation by Disadvantaged Business Enterprises in United States Environmental Protection Agency Programs
- 10. 40 CFR Part 35; State and Local Assistance

- 11. 40 CFR Part 35 Subpart 0; Cooperative Agreements and Superfund State Contracts for Superfund Response Actions
- 12. 48 CFR Chapter 1 Part 31 Subpart 31.2; Contracts with Commercial Organizations.

## ARTICLE XI NONDISCRIMINATION

In connection with the performance of the Project under this, the Professional agrees as follows:

a) The Professional will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, age, sex (as defined in Executive Directive 2019-09), height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position. The Professional will provide equal employment opportunities to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, religion, national origin, age, sex, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position.

Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

- b) The Professional will, in all solicitations or advertisements for employees placed by or on behalf of the Professional, state that all qualified applicants will receive equal employment opportunity consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position.
- c) The Professional or their collective bargaining representative will send to each labor union or representative of workers with which is held a collective bargaining agreement or other Contract or understanding, a notice advising the said labor union or workers' representative of the Professional's nondiscrimination commitments under this article.
- d) The Professional will comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended, MCL 37.2201 et seq; the Michigan Persons with Disabilities Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et seq; *Executive Directive 2019-09*; and all published rules, regulations, directives and orders of the Michigan Civil Rights Commission which may be in effect on or before the date of award of this Contract.
- e) The Professional will furnish and file nondiscrimination compliance reports within such time and upon such forms as provided by the Michigan Civil Rights

Commission; said forms may also elicit information as to the practices, policies, program, and employment statistics of the Professional and of each of their Consultant firms. The Professional will permit access to all books, records, and accounts by the Michigan Civil Rights Commission, and/or its agent, for purposes of investigation to ascertain nondiscrimination compliance with this Contract and with rules, regulations, and orders of the Michigan Civil Rights Commission relevant to Article 6, 1976 PA 453, as amended.

f) In the event that the Michigan Civil Rights Commission finds, after a hearing held pursuant to its rules, that the Professional has not complied with the contractual nondiscrimination obligations under this Contract, the Michigan Civil Rights Commission may, as part of its order based upon such findings, certify said findings to the State Administrative Board of the State of Michigan, which the State Administrative Board may order the cancellation of the Contract found to have been violated, and/or declare the Professional ineligible for future Contracts with the State and its political and civil subdivisions, departments, and officers, and including the governing boards of institutions of higher education, until the Professional complies with said order of the Michigan Civil Rights Commission.

Notice of said declaration of future ineligibility may be given to any or all of the persons with whom the Professional is declared ineligible to Contract as a contracting party in future Contracts. In any case before the Michigan Civil Rights Commission in which cancellation of an existing Contract is a possibility, the State shall be notified of such possible remedy and shall be given the option by the Michigan Civil Rights Commission to participate in such proceedings.

- g) The Professional shall also comply with the nondiscrimination provisions of 1976 PA 220, as amended, concerning the civil rights of persons with physical or mental disabilities.
- h) The Professional will include, or incorporate by reference, the nondiscrimination provisions of the foregoing paragraphs a) through g) in every subcontract or Contract Order unless exempted by the rules, regulations or orders of the Michigan Civil Rights Commission, and will provide in every subcontract or Contract Order that said nondiscrimination provisions will be binding upon each of the Professional's Consultant's or seller.

## ARTICLE XII CONTRACT CLAIMS AND DISPUTES

In any claim or dispute by the Professional which cannot be resolved by negotiation, the Professional shall submit the claim or dispute for an administrative decision by the Department of Technology, Management and Budget, Director of State Facilities Administration within thirty (30) consecutive calendar days of the end of the disputed negotiations, and any decision of the Director of State Facilities Administration may be appealed to the Michigan Court of Claims within one (1) year of the issuance of the Director's decision.

The Professional agrees that the Department's appeal procedure to the Director of State Facilities Administration is a prerequisite to filing a suit in the Michigan Court of Claims.

## ARTICLE XIII DEFINITION OF TERMS

The definition of terms and conditions of this Contract are described and outlined in the following Articles I through XIV and attached appendices. The capitalized defined terms used in this Professional Services Contract shall have the following definitions:

ADDENDA: Written or graphic numbered documents issued by the Department and/or the Professional prior to the execution of the Construction Contract which modify or interpret the Project Bidding Documents, including drawings, and specifications, by additions, deletions, clarifications or corrections. The Addenda shall: (1) Be identified specifically with a standardized format; (2) Be sequentially numbered; (3) Include the name of the Project; (4) Specify the Project Index No., Project File No., the Contract Order No. Y, and a description of the proposed Addenda; and (5) Specify the date of Addenda issuance. As such, the Addenda are intended to become part of the Project Contract Documents when the Construction Contract is executed by the Professional's recommended lowest responsive, responsible qualified Construction Contractor.

An Addendum issued after the competitive construction Bid opening to those construction Bidders who actually submitted a Bid, for the purpose of rebidding the Project work without re-advertising, is referred to as a post-Bid Addendum.

AGENCY PROJECT MANAGER: The assigned staff of the Department or the State/client Agency authorized by the State to represent and act on behalf of the Project Director on a given Project and to thereby provide direction and assistance to the Construction Contractor. The Agency Project Manager may designate in writing a person to act on behalf of the Agency Project Manager when they are unable to perform their required duties or is away from the office. In such cases, the Agency Project Manager must notify the Construction Contractor and the Project Director.

AGENCY FIELD INSPECTOR: An employee of the State of Michigan under the direction of the State/client Agency who provides the on-site, Inspection of construction Projects for compliance with the study/design intent of the Professional firm's Contract Documents/drawings and specification requirements and the building construction codes. The Agency Field Inspector is the liaison between the Construction Contractor, the Professional, and the Agency Project Manager. The Agency Project Manager, or their Agency Field Inspector, has the authority to require the Professional to respond to and resolve study/design related problems, construction on-site field problems and to attend Project related meetings.

BID: A written offer by a construction Bidder for the Department. Project construction work, as specified, which designates the construction Bidder's base Bid and Bid price for all alternates.

BIDDER: The person acting directly, or through an authorized representative, who submits a competitive construction Bid directly to the Department.

BIDDING DOCUMENTS: The Professional's Project Contract Documents as advertised, and all Addenda issued before the construction Bid opening, and after the construction Bid opening, if the Project construction work is rebid without re-advertising. Bidding Documents shall consist of the Phase 500 - Final Design drawings and specifications, any Addenda issued, special, general, and supplemental conditions of the Construction Contract, and modifications, if any, to standard forms provided by the Department. Such forms consist of the Project advertisement, the instructions to Bidders, the proposal forms, general, supplemental, and any special conditions of the Construction Contract, and the form of agreement between the Department and the Construction Contractor for the Project work requirements.

BID SECURITY: The monetary security serving as guarantee that the Bidder will execute the offered Construction Contract or as liquidated damages in the event of failure or refusal to execute the Construction Contract.

BUDGET: The maximum legislatively authorized Budget amount to be provided by the State of Michigan and available for a specific purpose or combination of purposes to accomplish the Project for this Contract.

BULLETIN: A standard document form (DTMB-0485, Bulletin Authorization No. and the DTMB-0489, Instructions to Construction Contractors for Preparation of Bulletin Cost Quotations for Contract Change Orders) used by the Department to describe a sequentially numbered change in the Project under consideration by the Department and the Professional and to request the Construction Contractor to submit a proposal for the corresponding adjustment in the Contract price and/or Contract time, if any. These standard document forms are a part of the "DTMB-0460, Project Procedures" documents package.

CONSTRUCTION CONTRACT: A separate written Contract agreement between the Construction Contractor and the Department for the construction, alteration, demolition, repair, or rebuilding of a State/Client Agency building or other State property.

CONSTRUCTION CONTRACTOR: Any construction firm under a separate Contract to the Department for construction services.

CONSTRUCTION INSPECTION SERVICES: The Professional's field Inspections of the Project during the construction Phase of this Contract which includes but is not limited to: (1) Documenting the quantity and quality of all Project construction work and verifying that the Project construction work is properly completed; (2) Resolve Project problems that are affecting the Project construction work, certify payment requests, process Bulletins, Contract Change Order recommendations, and requests for information (RFI's) in a timely manner as prescribed in the Department's, "MICHSPEC 2001 Edition of The Owner and Contractor Standard Construction Contract and General Conditions for Construction (Long Form)" or the current Department, DTMB Short Form 401 - Proposal and Contract/Front-End Package for Small Projects for Professional Services Contractors (PSC) with General Conditions for Construction and Instructions to Bidders" as adopted and modified by the State of Michigan and incorporated into the Construction Contract; and the (3) Inspection of Project construction work completed or in progress by the Construction Contractor to determine and verify to the Department's Project

Director/Agency Project Manager and their Department Field Representative that the Project construction work is in compliance with the Professional's design intent and that the Project has been completed by the Construction Contractor in accordance with the Professional's Phase 500 - Contract Documents/drawings and specifications requirements.

The Professional shall provide sufficient Inspections of the Project during the construction Phase to administer the construction Phase field and office services as directly related to the degree of Project complexity, up to and including full-time field Inspections. Construction field Inspections shall occur as the construction field conditions and the Project may require and during the regularly scheduled monthly progress and payment meetings.

The Professional shall use for their construction field Inspection services, only personnel having professional expertise, experience, authority, and compatibility with departmental procedures as the Department may approve. The Professional agrees that such characteristics are essential for the successful completion of the Project. Such individuals shall be replaced for cause where the Department determines and notifies the Professional, in writing, of their unacceptable performance.

CONSULTANT: Any individual, firm, or employee thereof, not a part of the Professional's staff, but employed by the Professional and whose professional service cost is ultimately paid by the State of Michigan, either as a direct cost or authorized reimbursement. This includes the recipient(s) of Contract Orders for material, support, and/or technical services. Also, included are persons and firms whose management and/or direction of services are assigned to the Prime Professional as may be provided elsewhere in this Contract.

CONTRACT CHANGE ORDER: A standard document form (DTMB-0403) issued and signed by the State of Michigan and signed by the Professional which amends the Project Design Professional's Contract Documents for changes in the Project/Program Statement or an adjustment in Contract price and/or Contract time, or both.

CONTRACT DOCUMENTS: The Professional's Phase 100 – Study, Final Report and Phase 500 - Final Design plans/drawings, specifications, Construction Contract, instructions to construction Bidders, proposal, Bidding Documents, agreement, conditions of the Contract, payment bond, performance/labor and material bond, prevailing wages, all Addenda, and attachments as may be necessary to comprise a Construction Contract for the Project. Specifications for this Contract will be prepared for Division 00 through 49, in the current version MasterFormat Outline by the Construction Specifications Institute (C.S.I.), as appropriate for the Project.

CONTRACT MODIFICATION: A form (DTMB-0410) amending the Contract signed by the Department and the Professional. The preparation of Bulletins and Contract Change Orders resulting from changes in the Project/Program Statement or previously unknown on-site field conditions as approved by the Department will be compensated to the Professional by way of the Contract Modification in accordance with the Article II, Compensation text of this Contract. Any Contract Modification of this Professional Services Contract must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the Department may require. No Contract Modification will be approved to compensate the Professional for correcting, or for responding to claims or litigation for, the Professional's Phase 100 – Study, Final Report and Phase 500 - Contract Documents study/design errors, omissions or neglect on the part of the Professional.

CONTRACT ORDER: A form (DTMB-0402) issued and signed by the State of Michigan authorizing a Professional to: (1) Begin to incur Project expenses and proceed with the Project on-site; and (2) Provide professional services for the fee amount designated in the Phases of the Contract Order. Issuance of the DTMB-0402 certifies that: (1) The State will enter into a Professional Services Contract for the professional services described in the various Phases of this Contract; and that (2) The proper three (3) sets of Certificate of Insurance documents have been received and accepted by the State along with the approval and signing of the Professional's Professional Services Contract by the SFA, DCD Director.

DEPARTMENT: The Department of Technology, Management and Budget, Facilities and Business Administration, Design and Construction Division. The Department will represent the State of Michigan in all matters pertaining to this Project. This Professional Services Contract will be administered through the Department on behalf of the State of Michigan and The State/Client Agency.

DESIGN MANUAL: Provides the Professional with information regarding the Department's current "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" review process requirements regarding the uniformity in Contract materials presented to it by the Professional and the State/Client Agency(ies). This manual contains the following noted standards, instructions, and procedures information for: (1) General instructions for planning documents from Phase 100-Study through Phase 500-Final Design; (2) Net and gross area/volume; (3) Project cost format; (4) Outline architectural and engineering specifications; (5) Specifications in documentation Phase; (6) Instructions for proposal; (7) Bidders questionnaire; and the (8) Project job sign.

DIRECTOR: The Director of the Department of Technology, Management and Budget or their authorized State of Michigan representative.

DIRECTOR-SFA: The Director of the Department of Technology, Management and Budget, State Facilities Administration or their authorized State of Michigan representative.

DEPARTMENT FIELD REPRESENTATIVE: An employee of the State under the direction of the Department who provides the Inspection of construction Projects for compliance with the design intent of the Professional's Phase 500 - Contract Documents/ architectural and/or engineering drawings and specification requirements and the building construction codes. The Department Field Representative is the liaison between the Construction Contractor, the Professional, and the Project Director/Agency Project Manager. The Project Director/Agency Project Manager, or their Department Field Representative, has the authority to require the Professional to respond to and resolve study/design related problems, construction field problems and to attend Project

meetings. Unless delegated by specific written notice from the Department, the Department Field Representative has no authority to order any changes in the Project scope of work or authorize any adjustments in Contract price or Contract time.

INSPECTION: The Professional and their Consultant firm's on-site and/or off-site examination of the Project construction work completed or in progress by the Construction Contractor to determine and verify to the Department's, Project Director/Agency Project Manager and their Department Field Representative that the quantity and quality of all Project construction work is in accordance with the design intent of the Professional's Phase 500 - Contract Documents/ drawings and specifications requirements.

KEY PRINCIPAL PERSONNEL/EMPLOYEE: An individual employee of a Professional who is essential for the successful completion of the Project.

NOTICE OF INTENT TO AWARD: A written notice to the Construction Contractor, by the Department accepting the Professional's written recommendation to award the construction Bid to the lowest responsive, responsible qualified construction Bidder. The Notice of Intent to Award letter will also designate the Contract price and itemize the alternates that the Department, at its sole discretion has accepted.

PHASE: A discretely distinguishable step necessary to produce the Project in the course of the Professional providing study, design and construction administration services.

PRIME PROFESSIONAL SERVICES CONTRACTOR/PROFESSIONAL: An individual, firm, partnership, corporation, association, or other legal entity who is legally permitted by law to sign and seal final design construction Contract Documents and licensed under the State of Michigan's professional licensing and regulation provisions of the Occupational Code (State Licensing Law), Act 299 of the Public Acts of 1980, Article 20, as amended, to practice architecture, engineering, environmental engineering, geology, civil, land surveying, or landscape architecture services in the State of Michigan.

The Prime Professional Services Contractor/Professional is also legally permitted by the State of Michigan's regulation provisions of the State Construction Code, Act 230 of the Public Acts of 1972, as amended, and designated in a Construction Contract by the Department to recommend construction progress payments to the Construction Contractor.

PROJECT: Any new construction, existing site, new utilities, existing building renovation, roof repairs and/or removal and replacement, additions, alteration, repair, installation, construction quality control and material testing services, painting, decorating, demolition, conditioning, reconditioning or improvement of public buildings, works, bridges, highways or roads authorized by the Department that requires professional study/design services as part of this Contract.

PROJECT COST: The total Project cost including, but not limited to, site purchase, site survey and investigation, hazardous material abatement, construction, site development, new utilities, telecommunications (voice and data), professional fees, construction quality control and material testing services, testing and balancing services, furnishings, equipment, plan(s)/drawing(s) design code compliance and plan review approval fees and all other costs associated with the Project.

PROJECT DIRECTOR: The professional licensed employee of the Department who is responsible for directing and supervising the Professional's services during the life of this Contract. The Project Director, or their Department Field Representative, has the authority to require the Professional to respond to and resolve study/design related problems, construction field problems and to attend Project related meetings.

PROJECT/PROGRAM STATEMENT: The Project/Program Statement is provided by the Department and defines the scope of the problem, describes why this Project is desirable, and provides a preferred resolution of the problem.

PROJECT TEAM: The Professional, the Project Director/Agency Project Manager, Department Field Representative, a representative of the State/Client Agency, and others as considered appropriate by the Department.

PUNCH LIST: A list of minor construction Project items to be completed or corrected by the Construction Contractor, any one of which do not materially impair the use of the Project work, or the portion of the Project work inspected, for its intended purpose. A Punch List shall be prepared by the Professional upon having made a determination that the Project work, or a portion of the Project construction work inspected, in concert with the Professional, the Construction Contractor, the Department, the Project Director/Agency Project Manager and their Department Field Representative, and any construction manager, is substantially complete and shall be attached to the respective DTMB-0455, Certificate of Substantial Completion form. This standard document form is a part of the "DTMB-0460, Project Procedures" documents package.

SOIL EROSION AND SEDIMENTATION CONTROL: The planning, design and installation of appropriate Best Management Practices (as defined by the most current version of the Department's Soil Erosion and Sedimentation Control Guidebook) designed and engineered specifically to reduce or eliminate the off-site migration of soils via water runoff, wind, vehicle tracking, etc. and comply with the Soil Erosion and Sedimentation Control in the State of Michigan as regulated under the 1994 Public Act 451, as amended – The Natural Resources Environmental Protection Act, Part 91 – Soil Erosion and Sedimentation Control. Soil Erosion and Sedimentation Control associated with this Contract will be monitored and enforced by the Department of Technology, Management and Budget, State Facilities Administration, Soil Erosion and Sedimentation Control Program.

STATE: The State of Michigan in its governmental capacity, including its departments, agencies, boards, commissions, officers, employees, and agents. Non-capitalized references to a state refer to a state other than the State of Michigan.

STATE/CLIENT AGENCY: A Department of the State of Michigan, for whose use the Project will ultimately serve, which requires professional design services.

SUBSTANTIAL COMPLETION: The form (DTMB-0445) stating that the Project work, or a portion of the Project work eligible for separate Substantial Completion, has been completed in accordance with the design intent of the Professional's Contract Documents to the extent that the Department and the State/Client Agency can use or occupy the entire Project work, or the designated portion of the Project work, for the use intended without any outstanding, concurrent work at the Project work site, except as may be required to complete or correct the Project work Punch List items.

SUSTAINABLE DESIGN: The Professional's use of a balance of appropriate materials, products and design methods that reduce the impact to the natural ecosystems and be within the Budget constraints of the Project. Sustainable Design shall be used wherever possible by the Professional in their Project design and an itemized list shall be provided with the Professional's Contract Documents that identifies the processes and products.

TASK: Shall mean the following: (1) A quantifiable component of design related professional study/design Task services required to achieve a Phase of the Project; (2) The most manageable sub-element within a study/design Phase; (3) A unique item of work within a study/design Phase for which primary responsibility can be assigned; and (4) Has a time related duration and a cost that can be estimated within a study, design, and construction Phase.

## ARTICLE XIV COMPLETE AGREEMENT / MODIFICATION

This Professional Services Contract constitutes the entire agreement as to the Project between the parties. Any Contract Modification of this Contract and the Project/Program Statement scope of work requirements must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the State may require. No Contract Modification may be entered into to compensate the Professional for correcting, or for responding to claims or litigation for the Professional firm's final design Contract Documents/study/design errors, omissions or neglect on the part of the Professional.

**APPENDIX 1** 

**PROJECT/PROGRAM STATEMENT** 

# **PROJECT STATEMENT**

#### STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET State Facilities Administration Design and Construction Division 3111 West St. Joseph Street Lansing, Michigan 48909

	-					
FILE NUMBER		PROPOSAL DUE DATE				
Various		Thursday, January 12.2023, at 2:00 p.m., EASTERN				
CLIENT AGENCY						
Department of Environment, Great Lakes, and Energy (EGLE)						
PROJECT NAME AND LOCATION						
2023 Environmental Indefinite Services Indefinite I	De	elivery (ISID)				
PROJECT ADDRESS (if applicable)	PROJECT ADDRESS (if applicable)					
Various						
CLIENT AGENCY CONTACT		TELEPHONE NUMBER				
Bridget Walsh		(517) 420-6379				
DTMB - DCD PROJECT DIRECTOR		TELEPHONE NUMBER				
Indumathy Jayamani		(517) 582-1089				
WALK-THROUGH INSPECTION DATE, TIME, AND LOCATION:						
There is no Pre-Proposal Meeting required.						

**MANDATORY** (Check box if Mandatory)

LEIN Check (Department of Corrections ONLY) All contractor / vendor representatives attending Preproposal Walk Through Meeting must submit a Vendor / Contractor LEIN Request form <u>five business</u> <u>days prior to the meeting date</u> (See the attached Vendor/Contractor LEIN Request Form). Send the LEIN Request form, filled and signed, by email to Daniel T. Smith at email address: <u>smithD76@michigan.gov</u>. The <u>email "Subject" must include (facility name, project name, date, and time of Pre-Proposal Walk</u> <u>Through Meeting</u>).

#### PROJECT DESCRIPTION/SERVICES REQUESTED

Provide professional environmental ISID services for a variety of State or Federally funded cleanup sites. The professional will be required to effectively perform tasks at assigned contaminated and/or hazardous waste sites through appropriate screening/investigation and/or remedial/corrective action plan to abate human health or environmental risks or bring an assigned site to an acceptable closure in accordance with the applicable Part 201 or Part 213 of the Michigan Natural Resources and Environmental Protection Act (NREPA) Public Act 451 of 1994, as amended and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and other relevant state and federal statutes and requirements. The Professional is required to refer to State and Federal statutes, procedures, guidelines, and the administration rules when providing the services or entering contracts with sub-consultants / subcontractors to provide the services. The Professional MUST upload their proposal to the State of Michigan Procurement website (SIGMA VSS). The Professional must use the attached appropriate forms to indicate the billing rates and questionnaires. The Professional may check one or more of the project types that they are interested in providing services. The State of Michigan reserves the right not to award the contract(s) or award the contract(s) to one or more firms.

Please NOTE:

- Proposal responses MUST be uploaded to SIGMA VSS. Please enter the total cost for all phases as the bid amount.
- Firms should only submit one (1) attachment (being less than 6 MB) for proposal submission. The attachment is to be the technical and cost proposal combined.
- Do not wait until just before the 2:00 p.m. solicitation deadline to submit your proposal response. SIGMA VSS will not allow a proposal to be submitted after 2:00 p.m., even if a portion of the

proposal response has been uploaded.

- If you experience issues or have questions regarding your electronic submission, you must contact the SIGMA Help Desk for assistance prior to the 2:00 p.m., solicitation deadline. You may contact the SIGMA Help Desk by telephone at 517.284.0540 or toll-free at 888.734.9749. You may also email the SIGMA Help Desk at sigma-procurement-helpdesk@michigan.gov
- Please email the Design and Construction Contract Specialists if you are having SIGMA VSS issues. Please include your SIGMA ticket number and any supporting documentation (i.e., screenshots) to Anne Watros (<u>WatrosA@michigan.gov</u>) and Don Klein (<u>KleinD4@michigan.gov</u>).
- You may be asked by our contract specialists to email your proposal. Emailed submissions will require DCD approval and will be handled on a case-by-case basis.
- Approved emailed submissions MUST be received prior to 2:00 p.m. deadline to be considered responsive and responsible.
- Responses should not be emailed to the Project Director.

#### **NIGP CODES**

90629; 91842; 91843; 92535; 92577; 92615; 92623; 92629; 92630; 92645; 92652; 92658; 92678; 92683; 92685; 92690; 92691; 92693; 92696; and 96273

#### DESIRED SCHEDULE OF WORK

Dependent on the assigned project

#### ACCEPTING RFP QUESTIONS UNTIL:

Please do not submit online questions via SIGMA VSS. ALL questions should be emailed to Indumathy Jayamani at <u>jayamanii1@michigan.gov</u> address no later than 2:00 p.m., Eastern on December 16, 2022.

REFERENCE STANDARDS: This project will comply with all codes, standards, regulations, and workers' safety rules that are administered by federal agencies (EPA, OSHA, and DOT), state agencies (DHHS, EGLE, DNR, and MIOSHA), and any other local regulations and standards that may apply.

This form is required to be a part of the professional service contract. (Authority: 1984 PA 431)



# MINOR STATE CAPITAL OUTLAY PROJECTS

# REQUEST FOR PROPOSALS FROM PROFESSIONAL SERVICE CONTRACTORS

(Authority PA 431 of 1984)

For Indefinite Scope Indefinite Delivery Not-to-Exceed Fee, Billable-Rate

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET Request for Proposal for 2023 Indefinite Scope Indefinite Delivery (ISID) for Environmental Services Various Locations, Michigan

PROPOSAL DUE DATE: Thursday, January 12, 2023, 2:00 p.m., Eastern Time

## **ISSUING OFFICE**

Department of Technology, Management & Budget State Facilities Administration Design and Construction Division



## Minor State Capital Outlay Projects REQUEST FOR PROPOSALS

Part I - Technical Proposal Part II – Cost Proposal

#### Professional Services for DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET 2023 Indefinite Scope Indefinite Delivery (ISID) Contract for Environmental Services Various Locations, Michigan

## SECTION I GENERAL INFORMATION

## I-1 <u>Purpose</u>

This Request for Proposals invites the prospective professional service contractor (Professional) to prepare a gualifications statement and proposal for an Indefinite Scope Indefinite Delivery (ISID) contract. ISID contracts provide the State of Michigan with a simple and streamlined qualifications-based selection process for obtaining professional environmental services for minor, emergency and / or routine investigation and remediation projects. Professionals holding an ISID contract may be contacted by a Department of Technology, Management and Budget (DTMB), State Facilities Administration (SFA), Design and Construction (DCD) Project Director to provide a specific proposal of services and fees for a particular project, which, if found acceptable, will then be assigned to that Professional under their ISID contract. Services requested may include, but not be limited to investigate, evaluate, design and supervise the implementation of abatements / remedies at assigned sites of environmental contamination under Parts 201 and 213 of the Michigan Natural Resources and Environmental Protection Act (NREPA) Public Act 451 of 1994, as amended, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (42 U. S. C. Chapter 103) and other relevant state / federal statutes and requirements. The services to be completed should encompass as a minimum the following phase(s) from DTMB's Sample Standard ISID Contract for Professional Environmental Services.

Projects will be located statewide, within both developed and undeveloped areas. Proposing firms must indicate regions and service areas in which they are willing to provide services, (refer to Questionnaire Articles 2 and 3, Project Types and Service Offered and Project Location, respectively).

The ISID contracts will supplement, but not replace, standard requests for proposals or qualifications as a method for obtaining professional services.
The 2023 Professional Environmental Services ISID contract will be limited to a term of three base years and one option year for assignments. A firm holding an ISID contract may not re-propose until their contract term is exhausted.

Firms with ISID contracts are eligible to participate in MIDeal, a cooperative purchasing program, local units of government, K-12 schools, state colleges and universities, and not for profit hospitals, may, if the firm agrees to participate, contract with an ISID contract holder at the billable rates specified in the ISID contract.

# Please Note:

# 1. FIRMS HOLDING ISID CONTRACTS ARE NOT GUARANTEED ANY ASSIGNMENTS

If DTMB, Design and Construction Division (DCD) determines that a particular project is suited to the ISID contracting method, The DCD Project Director will select an ISID Professional to provide a specific proposal of services and fee for that project. If the proposal is acceptable, the project will be assigned to that Professional under their ISID contract.

DCD reserves the option of requesting such proposals from more than one professional for a particular project.

ISID contracts may include, but not be limited to, the following phase(s) from DTMB's attached Sample Standard ISID Contract for Professional Environmental services.

### Phase-

- 100 Study
- 300 Schematic Design
- 400 Preliminary Design
- 500 Final Design
- 600 Construction Administration Office Services
- 700 Construction Administration Field Services
- 900 Operation and Maintenance Management Remediation Facility

The minimum professional qualifications to complete the scope of work for this project are demonstrated experience in the successful planning and execution of similar projects in full accordance with all applicable Local, State, and Federal regulations.

### I-2 Project/Program Statement

See attached project/program statement for more detailed information. The Professional, by submitting a Technical (Part I) and Cost (Part II) Proposal to DTMB for evaluation, states that they can and will provide complete services when an individual project is assigned to them.

No increase in compensation to the Professional will be allowed unless there is a material change made to the scope of work of the project/program statement and the change to the project/program statement is approved in writing by DTMB, State Facilities Administration (SFA), Design and Construction Division (DCD).

### I-3 Issuing Office

This RFP is issued by the Department of Technology, Management and Budget (DTMB), on behalf of the State of Michigan and its Client Agencies. <u>PROPOSALS SHALL BE RETURNED</u> <u>TO THE ISSUING OFFICE via State of Michigan Procurement website – SIGMA VSS</u>.

The point of contact for all other items in this Request for Proposal is:

Indumathy Jayamani, Project Director Department of Technology, Management and Budget State Facilities Administration, Design and Construction Division Telephone Number: (517) 582-1089 Email: jayamanii1@michigan.gov

### I-4 Contract Award

Professionals are requested to submit a two-part proposal, Technical Proposal - Part I, including a Qualifications Questionnaire, and Cost Proposal - Part II. Proposals will be evaluated by an Ad Hoc Advisory Committee based on the Technical Portion - Part I eighty percent (80%) and the Cost Proposal - Part II twenty percent (20%) with the following tentative percentage breakdown:

The Technical Portion will include the following breakdown:

Capacity and Quality	30%
Experience	30%
Personnel Staffing	30%
Business Organization and Contract Understanding	5%
Special Factors	5%

The Cost Portion will include the following breakdown:

Professional Billing Rates	75%
Billing Rate Increase	25%

The professional firm must complete the Professional Questionnaire (Appendix III) and select the Project Types and Project Locations they wish to be considered for. Provide attachments illustrating a minimum of three (3) examples, with references, of successful projects performed in the last five years for each item selected. Please include all the submitted resumes for all Project Types under one (1) appendix.

DTMB will offer a contract to several professional firms recommended by the Ad Hoc Advisory Committee after evaluation of the proposals. Recommendation is expected within forty-five (45) days following the due date of the proposal.

The Professional must include signed PSC Certification forms and the Addendum Acknowledgment form located at the end of this RFP as part of your proposal response.

### I-5 Rejection of Proposals

The State of Michigan reserves the right to reject any or all proposals, in whole or in part, received because of this Request for Proposals.

### I-6 Incurring Costs

The State of Michigan is not liable for any cost incurred by the Professional prior to acceptance of a proposal and the award and execution of a contract and issuance of the state's contract order.

### I-7 Mandatory Pre- Proposal Meeting

NO MANDATORY PRE-PROPOSAL MEETING will be conducted by the Issuing Office for this Request for Proposal.

Questions that arise because of this RFP **MUST BE EMAILED to Indumathy Jayamani** at <u>jayamanii1@michigan.gov</u> to the issuing office no later than **Friday, December 16**, **2022**, at **2:00 p.m.**, Eastern time (ET). If it becomes necessary to amend any part of this RFP, addenda will be posted on the SIGMA VSS website.

### I-8 <u>Responsibilities of Professional</u>

The Professional will be required to assume responsibility for all professional services offered in their proposal whether they possess them within their organization or not. Further, the State of Michigan will consider the Professional to be the sole point of contact regarding contractual matters, including payment of all charges resulting from the contract. The prime professional shall possess a license to practice in the State of Michigan pursuant to the Occupational Code (PA 299 of 1980).

### I-9 Proposals

The professional must submit a complete, straightforward response to this Request for Proposal. The proposal should describe the professional's ability to meet the requirements of the Request for Proposal.

The proposal must be submitted electronically through the State of Michigan Procurement System (SIGMA VSS). No other distribution of proposals will be made by the Professional. To be considered responsible and responsive, proposals must be uploaded to SIGMA VSS on or before 2:00 p.m., Eastern time (ET), on Thursday, January 12, 2022. The proposal must be signed by an official authorized to bind the professional firm to its provisions. NO FACSIMILES OR E-MAILS OF THE REQUEST FOR PROPOSAL WILL BE ACCEPTED.

The proposal and attachments must be fully uploaded and submitted prior to the proposal deadline. **Please do not wait until the last minute to submit a proposal**, as the SIGMA VSS system **will not** allow a proposal to be submitted after the proposal deadline identified in the solicitation, even if a portion of the proposal has been uploaded.

SIGMA has a maximum size limit on file uploads. When uploading, your attachment(s) the attachment must be 6mb or less.

Also, when entering proposal amount, please enter the total cost amount as \$1.00. Bidder's failure to submit a proposal as required may result in being deemed nonresponsive.

Questions on vendor registration, proposal submissions, or navigation in the SIGMA VSS system can be answered by contacting the SIGMA Help Desk either by telephone at 517.284.0540 or toll free at 888.734.9749 or by email at <u>sigma-procurement-helpdesk@michigan.gov</u>

# SECTION II PROPOSAL FORMAT - PART I – TECHNICAL

The proposal must be submitted in the format outlined below. Paginate proposals and ensure that the proposals refer specifically to the project at hand. Proofread proposals for language and mathematical errors. The items shown below are considered in the Ad Hoc Committee proposal review of technical qualifications.

### II-I General Information and Project Team

State the full name, address, and SIGMA Vendor Number of the organization and, if applicable, the branch office, consultants or other subordinate elements that will provide or assist in providing the service. Indicate whether you operate as an individual, partnership, or corporation. If a corporation, include the state in which you are incorporated. State whether you are licensed to operate and practice in the State of Michigan.

### II-2 Understanding of Project and Tasks

The professional must demonstrate an understanding of the project being considered and the professional services needed to achieve the state's goal. State your understanding of the project requirements and summarize your plan for accomplishing the project. Outline your experience with similar projects, sites, and clients as examples.

Explain how your firm or project team is the best suited to provide the services required for this project and would provide the best value to the State of Michigan for this work.

### II-3 Personnel

The professional must be able to staff a project team which has the qualifications and expertise necessary to undertake the project. Include the full names of all personnel by classification that will be employed in the project.

Indicate which of these individuals you consider to be "Key Personnel" for the successful completion of these project types, identify them by position and classification and provide their resumes.

The Professional must identify all Key Personnel that will be assigned to this contract in the table below which includes the following:

- a. Name and title of staff that will be designated as Key Personnel.
- b. Key Personnel years of experience in the current classification.

- c. Key Personnel's roles and responsibilities, as they relate to this RFP, if the Professional is successful in being awarded the Contract. Descriptions of roles should be functional and not just by title.
- d. Identify if each Key Personnel is a direct, or consultant employee.
- e. Identify where each Key Personnel staff member will be physically located (city and state) during the Contract performance.

The Professional must provide detailed, chronological resumes of all proposed Key Personnel, including a description of their work experience relevant to their proposed role as it relates to the RFP. Qualifications will be measured by education and experience with particular emphasis to experience on projects similar to that described in the RFP.

Provide an organization chart outlining authority and communication lines for each professional firm, including Key Personnel, including sub-consultants, client agency, and DTMB.

### II-4 Management Summary, Work Plan, and Schedule

This is for reference only and will be required for future assignments, but not required at this time. The professional must outline their work plan and methodology so that it is understood what services and deliverables will be provided, and the quality of the services and deliverables as well. Describe in detailed narrative form your plan for accomplishing the project. Describe clearly and concisely each professional task, event, and deliverable required for project completion. Do not simply reiterate language and tasks from the DTMB Professional Services Contract. Describe your constructability review and quality control plan. Include a detailed time sequenced – related but undated schedule, showing each event, task, and phase in your work plan. Allow time in the assignment schedule for the Owner's review.

### II-5 <u>Questionnaire</u>

The professional firm submitting a proposal must complete the Professional Questionnaire (refer to attached fillable form in Microsoft Word format). This questionnaire must be accompanied by a narrative addressing the items above.

# NOTE: Any information provided in one location can be referenced as needed in other locations

### II-6 <u>References</u>

Provide references, with contact information of previous clients, particularly for similar projects. Outline your experience with similar projects, sites, and contacts.

# SECTION III PROPOSAL FORMAT - PART II - COST

### III-1 Instructions and Information – Billable Rate

Outline the billable rates for the Professional's staff members who may be assigned to these projects. Specific proposals for individual projects will be obtained at the time of individual project assignment and shall correspond to all phases/tasks of the work plan requested at that time.

If sub-consultants are used for a particular assigned project, their fees shall be provided. **No mark-up** of the sub- consultants' fees or billing rates will be allowed.

Reimbursable Expenses: The State will reimburse the Professional for the actual cost of printing and reproduction of project deliverables such as surveys, reports, and bidding documents (drawings and specifications).

The State will also reimburse for U.S. Mail regular shipping or postage, soil borings, and any required laboratory testing. **No mark-up** of reimbursable expenses will be allowed.

The Professional firm's hourly billing rate shall be the actual amount paid for the employee services on the Project including fringe benefits, vacations, sick leave, other indirect costs, and profit. The Professional firm's hourly billing rates shall not change during the life of this Contract without written approval by the Department. See attached, **Overhead Items Allowed for the Professional Services Contractor Firm's Hourly Billing Rate Calculation**, for the guide to overhead items allowed for the professional services contractor firm's hourly billing rate calculation. Reimbursement for the Project/Program Statement scope of work requirements will be provided only for Department approved items authorized for reimbursement compensation in this Contract. The State will not reimburse the Professional for downtime, or for personnel involved in downtime due to mechanical problems or failure of Professional's or sub-consultant/subcontractor equipment.

Project related travel expenses (mileage, meals, lodging) for Projects <u>more than</u> one hundred (100) miles in one-way from the Professional's nearest office shall be treated as an authorized reimbursable expense at the State of Michigan's current travel rates based on DTMB's Vehicle and Travel Services Travel Rate.

### III-2 Identification of Personnel and Estimated Compensation

Provide compensation information for the Professional as well as any Sub-consultants. Note that employees of a separate professional firm or consultant, if proposed, should also be included, and noted.

### A. <u>Primary Professional and Sub-consultant(s) – Position, Classification and</u> <u>Employee Billable Rate Information</u>

Using the format of Form II-2-A (attached), identify the service being provided and the Professional's or Sub-consultant's employee(s) names and position classifications.

See Appendix II for guidelines for position classifications. For each employee, list the current hourly billable rate for each year covered under this proposal, Hourly billing rates shall include any anticipated pay increases over the life of the Professional's three-year ISID contract duration. Sub-consultant fees will be included in individually assigned project contracts as not-to-exceed reimbursable amounts.

For individual assigned projects, the proposal will identify the estimated cost for each task.

The total of all phases/tasks shall become the Professional's maximum not-to-exceed cost for the assigned project. Compensation for each phase will be in accordance with the attached sample contract Article II – Compensation.

The following items B, C, and D will be required only at the time a proposal for an individual assigned project is requested.

# Forms II-2-B, II-2-C, and II-2-D are for reference only and will be required for future assignments. These forms are not required for this proposal at this time.

## A. Fee with Anticipated Hours by Phase – for Individual Assigned Projects

Using the format of Form II-2-B, identify for each phase the estimated hours for each employee and include the billable rate for each employee. Provide totals.

### B. <u>Reimbursable Expenses – for Individual Assigned Projects</u>

Using the format of Form II-2-C, identify the phase number, firm name, and description of sub-consulting services, and/or description of all reimbursable direct expenses expressed as a not-to-exceed amount (travel over 100 miles one-way, printing, tests, etc.). Provide totals.

### C. Total, Summarized by Phase – for Individual Assigned Projects

Using the format of Form II-2-D, provide a total of the fees and reimbursable expenses, by phase, as outlined in items B and C above. The total of all phases shall become the Professional's maximum not-to-exceed contract for all design services. Compensation for each phase will be in accordance with the "Sample Standard ISID – Environmental Contract for Professional Services."

Use the attached forms to establish your total compensation and trade contract reimbursables.

The following instructions are to be used by the Professional Services Contractor firms to determine the hourly billing rate to use on State of Michigan Projects.

The Professional's Consultant must submit a separate hourly billing rate for the professional consultant services they will provide for State of Michigan Projects. No mark – up of the Professional's Consultant services hourly billing rates will be allowed.

The Department will reimburse the Professional for the actual cost of printing and reproduction of the Contract Bidding Documents, soil borings, surveys and any required laboratory testing services and use of field equipment. No mark-up of these Project costs will be allowed if services are performed in house.

### **2023 HOURLY BILLING RATE** Based on 2022 Expenses

### OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

<u>SALARIES</u> :	EMPLOYEE BENEFITS:	INSURANCE:
Principals (Not Project	Hospitalization	Professional Liability Insurance
Clerical / Secretarial	Employer's Federal Insurance Contributions Act (FICA)Tax	Flight and Commercial Vehicle
Technical (Not Project Related)	Unemployment Insurance	Valuable Papers
Temporary Help Tax Technical Training Recruiting Expenses	Federal Unemployment Disability Worker's Compensation Vacation Holidays Sick Pay Medical Payments Pension Funds Insurance - Life Retirement Plans	Office Liability Office Theft Premises Insurance Key – Personnel Insurance Professional Liability Insurance
TAXES:	SERVICES (PROFESSIONAL)	EQUIPMENT RENTALS:
Franchise Taxes Occupancy Tax Unincorporated Business Tax	Accounting Legal Employment Fees	Computers Typewriter Bookkeeping
Single Business Tax Property Tax Income Tax	Computer Services Bond) Research Project / Contract Bond	Dictating Printing Furniture and Fixtures Instruments

### OFFICE FACILITIES: LOSSES:

### FINANCIAL:

Rents and Related Expenses Utilities Cleaning and Repair Bad Debts (net)

Depreciation

Uncollectible Fee Thefts (not covered by Project / Contract) Forgeries (not covered by Project / Contract)

Specifications (other than

Drawings (other than

Contract Bidding documents)

Contract Bidding documents)

### SUPPLIES:

## Postage

Drafting Room Supplies General Office Supplies Library Maps and Charts Magazine Subscriptions

Xerox / Reproduction

Photographs

PRINTING AND

DUPLICATION:

### SERVICES (NONPROFESSIONAL):

Telephone and Telegram

Messenger Services

### TRAVEL:

All Project – Related Travel\*

### MISCELLANEOUS:

Professional Organization Dues for Principals and Employees Licensing Fees

II-2-A. Position, Classification and Employee Billing Rate Information

### Firm Name

Yearly Hourly Billing Rate Increase

### XYZ, Inc. ≈2%

	<del>n</del>			
Position/Classification				
	Year 2023	Year 2024	Year 2025	Year 2026
Principal/Project Manager**	\$100.00	\$105.00	\$110.00	\$116.00
Senior Architect	\$100.00	\$105.00	\$110.00	\$116.00
Quality Control/Assurance	\$100.00	\$105.00	\$110.00	\$116.00
Licensed Surveyor**	\$90.00	\$95.00	\$99.00	\$104.00
Project Engineer**	\$90.00	\$95.00	\$99.00	\$104.00
Mechanical Engineer**	\$90.00	\$95.00	\$99.00	\$104.00
Sr. Structural Engineer	\$80.00	\$84.00	\$88.00	\$92.00
Electrical Engineer	\$80.00	\$84.00	\$88.00	\$92.00
Scientist/Surveyor	\$65.00	\$68.00	\$71.00	\$75.00
Staff Engineer	\$65.00	\$68.00	\$71.00	\$75.00
Staff geologist	\$65.00	\$68.00	\$71.00	\$75.00
CAD Operator	\$75.00	\$79.00	\$83.00	\$87.00
Technician	\$65.00	\$68.00	\$71.00	\$75.00
Field Technician	\$50.00	\$53.00	\$56.00	\$59.00
Technical Support	\$35.00	\$37.00	\$39.00	\$41.00

\*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate Calculation," and the "Sample Standard Contract for Professional Services," Article 5, Compensation Text.

\*\* Key Project Personnel

	TOTAL HOURS	BILLING RATE	TOTAL
POSITION/ CLASSIFICATION			
Principal/Project Manager	30	100.00	3,000.00
Senior Architect	17	100.00	1,700.00
Licensed Surveyor	9	90.00	810.00
Project Engineer	8	90.00	720.00
Mech. Engineer.	8	90.00	720.00
Sr. Structural Engineer	8	80.00	640.00
Electrical Engineer	22	80.00	1,760.00
Draftsperson	40	35.00	1,400.00
Quality Control	2	100.00	200.00
CAD Operator	42	35.00	1,470.00
SUBTOTAL	186		\$10,667.50
	I		

# II-2-B. Fee with Anticipated Hours and Billing Rate

# II-2C. Authorized Reimbursables -- Sub-consultants, Testing and Expenses

\*Firm's Mark-Up Percentage:\_\_\_\_\_

PHASE	NAME OF FIRM	DESCRIPTION OF SERVICES PROVIDED	TOTAL AMOUNT* (Including mark-up)
Phase 400	Forrest T. Arrea, Landscape Architect, Howell, Michigan	Design of Stormwater Management Rain Garden	500.00
Phase 500	XYZ Productions, Inc. Lansing, Michigan	Printing and reproduction of bidding documents	500.00
Phase 500	Forrest T. Arrea, Landscape Architect, Howell, Michigan	Design of Stormwater Management Rain Garden	500.00
	SUBTOTAL		\$ 1,500.00

# III-2D. Total, Summarized by Phase

PHASE	Phase 300	Phase 400	Phase 500	Phase 600	Phase 700	TOTAL
Professional Fee	1,597.50	2,820.00	3,970.00	1,120.00	1,160.00	10,667.50
Reimbursable Expenses	0.00	750.00	1,250.00	0.00	500.00	1,500.00
SUB-TOTAL	1,597.50	3,570.00	5,220.00	1,120.00	1,660.00	
TOTAL CONTRACT AMOUNT						\$ 12,167.50



# **Certification of a Michigan Based Business**

(Information Required Prior to Contract Award for Application of State Preference/Reciprocity Provisions)

To qualify as a Michigan business:

Vendor must have, during the 12 months immediately preceding this bid deadline: or

If the business is newly established, for the period the business has been in existence, it has:

(Check all that apply):

- Filed a Michigan single business tax return showing a portion, or all the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL ~208.1 208.145: or
- Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or

Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

Bidder qualifies as a Michigan business (provide zip code: \_\_\_\_\_)

Bidder does not qualify as a Michigan business (provide name of Stat	e:).
--	------

Principal place of business is outside the State of Michigan, however
service/commodity provided by a location within the State of Michigan (provide zip
code:)



## DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET State Facilities Administration Design & Construction Division

Bidder:

Authorized Agent Name (print or type)

Authorized Agent Signature & Date

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN \$25,000 and subject to debarment under MCL 18.264.



# **Responsibility Certification**

The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

- (a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.
- (b) Has not had a felony conviction in any state (including the State of Michigan).
- (c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification, or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid rigging, or a violation of state or federal anti-trust statutes.
- (d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.
- (e) Has not been terminated for cause by the Owner.
- (f) Has not failed to pay any federal, state, or local taxes.
- (g) Has not failed to comply with all requirements for foreign corporations.
- (h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.
- (i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:
  - i. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
  - ii. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.



- iii. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the period required.
- iv. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).
- v. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.
- vi. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
- vii. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).
- (j) Is NOT an Iran linked business as defined in MCL 129.312.

I understand that a false statement, misrepresentation, or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

Bidder:

Authorized Agent Name (print or type)

Authorized Agent Signature & Date

I am unable to certify to the above statements. My explanation is attached.





# ACKNOWLEDGMENT OF ADDENDUMS

PSC acknowledges receipt of Addenda: No. \_\_\_\_ dated: \_\_\_\_\_,

No. \_\_\_\_ dated: \_\_\_\_\_ No. \_\_\_ dated: \_\_\_\_\_



# 2023 Indefinite Scope Indefinite Delivery (ISID) Contract for Professional Environmental Consulting Services Scope of Work

## SUMMARY

The State of Michigan is requesting the services of Professional Services Contractor(s) to provide high-quality environmental services to investigate, evaluate, design, and supervise the implementation of abatements/remedies at assigned sites of environmental contamination under Parts 201 and 213 of the Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); and other relevant federal statutes and requirements. The State intends to form a list of firms for several project types. If the professional chooses to be considered for one or more of the project types, the Professionals must be able to perform tasks required by each checked project type to bring the assigned site(s) into compliance with current state and federal environmental requirements.

For the list, preference will be given to firms, in the State of Michigan, generally meeting the following requirements.

- Experience working at Parts 201 and 213 of NREPA 1994 P.A. 451, as amended sites.
- Experience working at CERCLA regulated sites.
- Experience in conducting effective environmental assessment, RI, and FS services.
- Experience in conducting effective vapor intrusion to indoor air assessments and mitigation of vapor intrusion risks to both residential and non-residential structures.
- Experience with the development of human health and ecological risk assessments.
- Experience with database development and management.
- Ability to perform sampling and provide technical review and Quality Assurance/Quality Control (QA/QC) of provided laboratory data.
- Ability to provide comprehensive professional services for the assigned projects.
- Accounting systems with capability to provide detailed cost documentation.

- Consideration will be given to the number and location of the satellite offices, record of past performance, and financial and technical resources.
- Expertise with the selected project type(s).

A number of contaminated sites have been identified in Michigan. This includes sites appearing on the list of contaminated sites authorized by Part 213 and Part 201 of the NREPA 1994 PA 451, as amended. Major steps in resolving the contamination problems at these sites are environmental assessment/investigation and abatement. The State, through review and evaluation of the responses to this RFP, anticipates selecting one or more Professionals to place on a list to provide environmental services on small, urgent, and simple projects. The professional will be required to provide professional environmental services, technical staff, and support personnel for the ISID minor projects on an as- needed basis for various State/Client Agencies within the State of Michigan.

The executed contract will be for professional environmental services for an unspecified number of ISID projects. The scope of work for each assigned project will be defined at the time the project is awarded by the State to the Professional. The professional environmental services required for each of these assigned projects requested by the Department may include any or all the Tasks included in the Phase 100 – Study through the Phase 900 – Operation and Maintenance Management as detailed in the attached SAMPLE contract.

### SCOPE OF WORK

The typical environmental services to be performed at these sites under these ISID contracts may include but not be limited to:

- 1. Asbestos / Lead / Mold / Biohazard / Free Product / Regulated Waste Survey / Abatement
- 2. Brownfield Development
- Ecological Risk Assessment / Forestry and Land Management / Wetland Mitigation / Streams and Lakes Restoration
- 4. Environmental Investigation / Characterization / Pilot Tests / Feasibility Study
- 5. Environmental/ Roto Sonic Drilling / Well Abandonment
- 6. Ground Penetrating Radar (GPR) / Laser-Induced Fluorescence (LIF) Field Screening
- 7. Landfill Maintenance / Monitoring
- 8. Nuclear Waste Management / Disposal / Remediation
- 9. Per-& Polyfluoroalkyl Substances (PFAS) Sampling / Mitigation / Remediation
- 10. Phase I / Phase II / Baseline Environmental Assessments
- 11. Remediation Systems Design / Construction Oversight / O&M / Decommissioning
- 12. Specialty Sub-Surface / Utility Inspection / Sewer Camera / Cleaning

13. Underground / Aboveground Storage Tank (UST/AST) Removal / Demolition / Soil Excavation / Closure

14. Vapor Intrusion Assessments / Risk Mitigation / Design / Installation / O&M Services

While performing this work, the consultant may be required to develop site specific project work plans, health, and safety plans (HASPs), quality assurance/quality control plans, bid specifications, and community relations plans.

In addition to these activities, the State may request the Professional to perform the following additional tasks, including but not limited to: assisting the State in acquiring site access; professional assistance for assessing potential uncontrolled hazardous material sites; obtain any permits which are required for the performance of the work; conduct work in a timely manner; ensure security of the site and equipment; comply with the State Environmental Policy Act and local, State and Federal permit requirements prior to conducting remedial actions; provide enforcement support, such as documentation of facts and information about a site and expert testimony during enforcement proceedings; and provide other program development and management assistance for the State departments/agencies. This assistance may include review of plans, drawings, specifications, proposals, technical reports, and other work products associated with a hazardous substance/contaminated site where a release has occurred or is likely to occur; the assessment of environmental and public health risks; record searches; historical reviews; research on technical issues; and personnel training.

### ASSIGNMENTS

Services will be requested for an assigned project and will be in accordance with a cost proposal submitted and approved at that time. The professional is expected to have the costs of all required activities needed to complete the assignment.

Individual project assignments will be based on a written Statement of Objectives provided by the State and a proposal from the Professional to perform the scope of work. It is anticipated the assigned work will be completed before the expiration date of the Contract. However, assignments made during the period of the Contract may include work that will continue after the end date of the Contract period. If the State determines there is an imminent endangerment of human health or the environment, design of an emergency abatement system may be assigned under the Contract.

### **DISPOSAL OF WASTE**

Any wastes generated during the performance of work under this Contract must be disposed of in conformance with all applicable state and federal laws, rules, and/or regulations. For all wastes being disposed under this Contract, it is the responsibility of the Professional to ensure compliance with this directive.

The Professional shall sign waste manifests on behalf of the State attesting to the accuracy and completeness of the manifest, when requested, at sites for which they are performing oversight. The State will retain generator status for these wastes. If necessary, the State will provide a letter to the Professional conveying this authority.

The Professional shall properly dispose of any samples they retain during site work upon written permission from the Agency Project Manager. Disposal of samples is not a billable expense but may be included in the Professional's overhead.

### ENVIRONMENTAL DRILLING

The Professional shall competitively bid environmental drilling work to at least three (3) drilling contractors for each drilling assignment unless the Professional can demonstrate to the Agency Project Manager's satisfaction that there is only one qualified firm who can adequately perform the work as specified. If the Professional determines the services of a specific drilling firm are required, the Professional must state those reasons in writing to the Agency Project Manager for concurrence. The written request will address cost effectiveness, time constraints, geologic situations, and drilling methodologies.

The format and process used for bidding will be in accordance with industry standards and based upon a method chosen by the Professional that is most advantageous to the State. The frequency of bidding necessary within one project assignment will be decided upon between the Professional and the Agency Project Manager. Copies of all bid documents will be provided to the Agency Project Manager. Costs incurred by the subcontractor for environmental drilling shall be billed to the State as a reimbursement.

<u>Ineligible Costs</u> - The Professional cannot bill the State for the drilling subcontractor's time to develop work plans, prepare bid specifications for work plans, or to attend site safety meetings.

<u>Billing Rates</u> - If a drilling subcontractor provides other technical services such as geophysical testing, then the Professional must submit billing rates, fees, resumes, wages, and salary ranges for that Subcontractor.

<u>Downtime for Equipment and Supplies</u> - The Agency Project Manager has the option to purchase supplies and equipment. If the State purchases equipment for use at a site, the State is responsible for that equipment and may need to compensate the Professional for downtime or demobilization costs if the equipment does not function properly. If the Professional furnishes supplies and equipment that do not function properly and causes downtime, the State will not compensate the Professional for the downtime. Also, the State will not reimburse the Professional for backup supplies and equipment. The State will only reimburse the Professional for supplies and equipment used at the site or that must be available as indicated specifically by the health and safety or work plan.

### LABORATORIES

The Professional may be required to obtain samples, prepare them for shipping, ship, and pick up samples or any other activity associated with sample collection and interpretation as determined necessary by the Agency Project Manager.

All laboratory analyses shall be performed by the EGLE lab, unless the Agency Project Manager approves use of a current ISID Environmental Laboratory contract holder, an EPA -CLP lab, or another lab as deemed necessary by the State. If a private lab, other than an ISID State Contract Lab, is to be used to perform the analyses, prior written permission by the Agency Project Manager is required. The private lab must report data in a format consistent with the format used by the State and must include the same level of detail regarding QA/QC documentation and chain of custody records.

### EQUIPMENT AND SUPPLY PURCHASES AND RENTAL PROCEDURES

Certain Agency procedures may apply to equipment, supplies, surveys, and other items as specified by the Project Director/Agency Project Manager and will be treated as reimbursements or Other Direct Costs (ODCs). Computers and computer related materials may be included as part of such procedures; however, prior written approval from the Department regarding computers and software must be secured.

If an item will be consumed or would be expected to be rendered unusable during the project assignment, then renting is not a viable alternative and purchasing the item is necessary. Examples of consumption are bags of cement and installed casing. Examples of items expected to be rendered unusable are tyveks and disposable bailers. If the rental price or price of using the Professional's equipment exceeds the purchase price the item shall be purchased.

If renting is an option, the cost shall be based upon the expected time of usage of that service or equipment or supply. The rental charge or charge for the Professional's equipment shall include maintenance, calibration, parts replacement, and service charges for the equipment. A table recording the costs incurred to date to rent equipment, or to use the Professional's equipment, shall be included in each monthly progress report. This table shall also include the purchase price for each piece of equipment. Each item required for the project shall be listed separately.

At the end of the project, the State has the OPTION to accept ownership of a purchased piece of equipment.

If an assignment must be modified to provide for additional scope of work, the cost effectiveness of purchasing, renting, or using the Professional's equipment must be determined for the additional work.

All deposit charges will be paid by the Professional and will not be reimbursed by the State.

### HEALTH AND SAFETY PLANS (HASP)

The nature of the work to be performed under this Contract is hazardous.

In addition to Health and Safety Plan requirements noted in the Phase/Task section of the Contract the following will also apply:

The Professional shall satisfy **29 CFR 1910.120** and Section 24 of Act 154 PA 1974 as amended and corresponding rules and all federal, state, and local statutes, regulations, ordinances, etc., regarding health and safety **(40 CFR 35.6055(b)).** 

**Prior** to executing any work at the assigned site, the Professional shall develop and submit all HASPs for the site to the Agency Project Manager for review, acceptance, and inclusion into the work plan.

The Professional shall arrange for all its employees that will be working on a contaminated site to attend a health and safety training course, and/or a personnel protection course. The Professional is responsible for all costs related to the training. When requested by the State, the Professional must provide proof of completion of health and safety training for each employee working on a site prior to the employee entering the site for any purpose.

The Professional will ensure that employees and sub-consultant's/subcontractor's employees wear protective clothing and use equipment specified in the site Health and Safety Plan at all times the employee is on the site.

Health and Safety Training and Medical Monitoring are not considered reimbursable items under this Contract. When working in any level of safety equipment, the level itself does not dictate additional costs, but the equipment costs above Level D are reimbursable.

### INVOICING AND PAYMENT PROCEDURES

Documentation for payment will be submitted monthly per the requirements in the Contract. Project costs will be reimbursed to the Professional on an as-incurred basis in accordance with the terms of the Contract for Professional Services. Invoices received covering service periods for which the progress reports have not been received by the State will not be processed until the progress reports are received. These will be considered incomplete invoices.

Each invoice that includes labor will include a one-page summary sheet that lists by date the name of the individual providing the professional service, the individual's position/classification, hours worked that day, and hourly billing charge. Each invoice that includes reimbursable expenses will include a one-page summary with the following categories: Meals, Lodging, Travel, Shipping, Equipment Rental, Field Supplies/Equipment Purchase, sub-consultants, and Miscellaneous. Under Meals and Lodging categories, the date, name of the individual and total daily cost will be included. Under Travel category, the Professional will include the date, name of the individual, total mileage (above the allowed amount specified in the Contract), mileage rate, and total daily cost. Under Shipping, the Professional will include the date shipped, description of item shipped (e.g., tech memo, etc.) and the cost to ship the item. Under Equipment Rental, the Professional will include the range of dates equipment rented, description of equipment rented and rental cost. Under Field Supplies/Equipment Purchase and Miscellaneous categories, the Professional will include the date purchased, description and purpose of the item purchased and the cost. Under subconsultants/subcontractors, the Professional will list the date of the subconsultant/subcontractor work, name of the sub-consultant/subcontractor, description of work conducted, and the cost. The cost for each category will be totaled.

<u>Contract Close-Out</u> – Final payment shall be withheld until all deliverables have been received and accepted by the State. In addition, the Professional will be required to submit to the Agency Project Manager, an unconditional waiver, signed by an authorized representative of each sub-consulting/subcontracting firm, used on the project, indicating that they have been paid in-full by the Professional for all work performed.

### LITIGATION SUPPORT

The Professional's personnel and the personnel of its sub-consultants/subcontractors will be required, if requested by the Agency Project Manager on behalf of EGLE's attorneys, to provide assistance to the State in the form of participation in legal actions against alleged responsible parties for violation of state and/or federal environmental law or the recovery of public expenditures regarding any of the operations the Professional or its sub-consultants/subcontractors are involved in under this Contract. This assistance may include, but is not limited, to the preparation of reports and assisting state and/or federal attorneys in preparation of the government's case, including the preparation and execution of interrogatories, affidavits, and testimony as a fact witness.

The State will reimburse the Professional for such assistance as described above at the contractually approved rates for the Professional's personnel at the time services are required. The Professional shall insert an identical obligation to provide such assistance in all sub-consultants/subcontractor agreements to perform work under this Contract. Failure to meet the requirement of this section shall be considered a breach of this Contract.

In addition, the Professional agrees that upon the Agency Project Manager request on behalf of the State attorney, that the Professional's personnel or the personnel of its subconsultants/subcontractor will appear at trial as an expert witness. If expert testimony is requested, the Professional and State mutually agree while the State cannot, due to Section 2164 of the Revised Judicature Act, guarantee to pay the Professional's personnel any sum in excess of the current per day expert witness fee, the State attorney may ask the court to permit the State to pay the Professional's personnel for the appearance as an expert witness on behalf of the State, at a rate equal to the rate of the employee's contractually approved rates at the time services are required, for the actual time of court appearance plus travel time and standard expenses as defined in the Contract. To the extent that the court grants such a request, the Professional agrees to reimbursement at such rates.

- 1. If the Professional receives a subpoena or if an Assistant Attorney General assigned to the site requests information regarding one of the Professional's assignments, the Professional may release that information without the Agency Project Manager's prior written permission. However, the Professional must provide, in writing, to the Agency Project Manager a letter documenting what information has been released, to whom and when. Any other requests to release information continue to require the Agency Project Manager prior written permission. The party requesting the information has an obligation to pay for any copying costs. If the State requests duplicate copies, the State will reimburse the Professional for copying costs.
- 2. If a party other than the State requests the Professional provide testimony regarding an assignment for which they have performed work under this Contract, either through deposition or testimony in court, the State will <u>NOT</u> reimburse the Professional for that testimony. Depositions or testimony requested by parties other than the State are not covered by this Contract, and payment for a deposition or testimony may be prohibited by MCL 600.2164.

3. If a State Assistant Attorney General requests the Professional assist in preparation for litigation, i.e., answering interrogatories, preparing for trial via interviews, and discussions concerning the site, this time is reimbursable under this Contract.

### PROJECT CONTROL REPORTS AND DELIVERABLES

1. Deliverables

The Professional shall provide electronic copies of all final reports, plans, specifications, drawings, and other significant deliverables in Microsoft Word, Excel, AutoCAD, and ArcGIS as applicable, as well as in separate PDF format, provided on one (1) portable media device. Reports that require submittal into RIDE shall be submitted by the Professional as applicable. In addition, the Professional shall provide one unbound, reproducible copy of each deliverable for each of the assigned projects or as specified in the assigned project scope of work. The Department/Agency will be responsible for obtaining access to the assigned sites, providing a map for the assigned sites, and where applicable, previous investigation/analytical results for work conducted at the assigned sites.

- 2. Project Control
  - A. The Professional will carry out the assignments under this Contract under the direction of the Project Director and/or the Agency Project Manager.
  - B. The Professional will submit brief written monthly (or any other interval deemed necessary by the State) progress reports that outline: the work accomplished during the reporting period including basis for significant decisions; work to be accomplished during the subsequent reporting period; daily field activity logs; problems, encountered or anticipated; notification of any significant deviation from the approved work plans; and budget/expenditure information including: project budget, cumulative expenses, projected expenses, and explanations of budget deviations for each major task. <u>Staff time and costs to correct errors, omissions, and deficiencies in the work are not reimbursable.</u> The Agency Project Manager may adjust the frequency of reports depending upon the nature of the project or phase of a particular project.
- 3. Reports

All project reports required as deliverables to this Contract will begin with an Executive Summary.

This will briefly outline the conditions encountered at the site, work performed at the site, conclusions drawn from this work, a list of the recommended alternatives for site remediation (where applicable), and a short description of any specifications prescribed by the report. The Executive Summary will be a synopsis of all information presented in the report and organized in logical manner to present an overview of the specific report. Each assignment will require specific reporting requirements.

The following are examples of reports that may be required from the Professional:

- A. Monthly progress reports.
- B. Draft and Final Preliminary Site Investigation Work Plans and assessment reports
- C. Draft and Final FS/RI Work Plans and reports
- D. RI technical memoranda for groundwater sampling, surface water sampling, soil/sediment sampling, air quality sampling, and site hazards assessment. The technical memoranda should summarize the data and collection techniques and include an evaluation of the data.
- E. Daily field logs which include equipment and supply charges and personnel on site. These shall be maintained and attached to the corresponding monthly-progress reports.

The following tasks may be required to produce reports/work products listed above:

- Community Relations
- FS (including Risk Assessment)
- Natural Resource Damage Assessment (NRDA)
- UST removal/closure and other Related Work
- Potentially Responsible Party (PRP) Identification
- Preliminary Site Investigation
- Risk-Based-Corrective-Action Activities
- RI and recommendations
- Baseline Environmental Assessments Review
- Contract Transition Tasks

All draft documents and communications with the State regarding guidance, input, acceptance, and approval shall be marked "DRAFT" and "Deliberative Process – FOIA Exempt". Information so designated shall not be provided in response to a Freedom of Information Act (FOIA) request.

4. The Professional and/or its sub-consultants/subcontractors shall follow the current edition of ASTM Standard D 5299-92 (Standard Guide for Decommissioning Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities) and other guidance as provided by the State as a performance standard for monitoring well, soil boring, and vadose zone monitoring device abandonment.

### **SELECTION CRITERIA**

Responses to this RFP will be evaluated based upon the technical merit, conciseness, clarity, creativity, thoroughness of the proposal, understanding of the assignments and contract requirements. Also, evaluations of qualifications and experience will be conducted for each of the project types checked in the proposal.

Depending on available funding for cleanup activities, the State anticipates awarding contracts to one or more professionals meeting the requirements of the RFP and receiving the highest scores in the evaluation. The State reserves the right not to award the contract(s) or award contract(s) to one or more firms for the submitted proposals. The State may reject proposals in whole or in part and may waive any informality or technical defects if, in the judgment of the selection committee, the best interest of the State will be served.



### Department of Technology, Management and Budget 2023 Indefinite-Scope Indefinite-Delivery – Request for Qualifications Professional Environmental Consulting Services Questionnaire Various Locations, Michigan

**INSTRUCTIONS:** Firms shall complete the following information in the form provided. A separate sheet may be used if additional space is needed; please key the continuation paragraphs to the questionnaire. Answer questions completely and concisely to streamline the review process. If you provide information in this questionnaire that is relevant to any other parts of the proposal, please reference the article numbers to avoid repetition.

### ARTICLE 1: BUSINESS ORGANIZATION

 Full Name: <u>Click or tap here to enter text.</u> Address: <u>Click or tap here to enter text.</u> Telephone and Fax: <u>Click or tap here to enter text.</u> Website: <u>Click or tap here to enter text.</u> SIGMA Vendor ID: <u>Click or tap here to enter text.</u>

If applicable, state the branch office(s), partnering organization or other subordinate element(s) that will perform, or assist in performing, the work: <u>Click or tap here to enter text.</u>

If awarded a contract and / or subsequent assignment(s), state the specific SIGMA business address which you would like associated for all communication (Contracts, Contract Order, Contract Modifications and Payments)? <u>Click or tap here to enter text.</u>

Please list all person(s) authorized to receive and sign a resulting contract and / or subsequent assignment(s). Please include persons name, title, address, email and phone number. <u>Click or tap here to enter text.</u>

2. Check the appropriate status:

Individual firm Association Partnership Corporation, or Combination -

Explain: Click or tap here to enter text.

If you operate as a corporation, include the state in which you are incorporated and the date of incorporation: <u>Click or tap here to enter text.</u>

Include a brief history of the Professional's firm: Click or tap here to enter text.

3. Provide an organization chart depicting key personnel and their roles for a typical assigned project. Include generic supporting staff positions.

- 4. Has there been a recent change in organizational structure (e.g., management team) or control (e.g. merger or acquisition) of your company? If the answer is yes: (a) explain why the change occurred and (b) how this change affected your company. <u>Click or tap here to enter text.</u>
- 5. Provide a four year rate schedule per position.

### ARTICLE 2: PROJECT TYPES AND SERVICES OFFERED

Identify the project types and professional services for which your firm is exceptionally qualified and experienced. Contractor should have the capability to form potential teams with adequate experience in environmental investigation and remediation services. Provide attachments illustrating a minimum of three examples, with references, of successful projects performed in the last five years for each item checked. Identification of specialties will assist the State project directors/managers in matching firms with projects.

□ Asbestos / Lead / Mold / Biohazard / Free Product / Regulated Waste Survey /

### Abatement

- □ Brownfield Development
- Ecological Risk Assessment / Forestry and Land Management / Wetland
  Mitigation / Streams and Lakes Restoration
- □ Environmental Investigation / Characterization / Pilot Tests / Feasibility Study
- □ Environmental/ Roto Sonic Drilling / Well Abandonment
- Ground Penetrating Radar (GPR) / Laser-Induced Fluorescence (LIF) Field Screening
- □ Landfill Maintenance / Monitoring
- D Nuclear Waste Management / Disposal / Remediation
- Der-& Polyfluoroalkyl Substances (PFAS) Sampling / Mitigation / Remediation
- D Phase I / Phase II / Baseline Environmental Assessments
- □ Remediation Systems Design / Construction Oversight / O&M / Decommissioning
- □ Specialty Sub-Surface / Utility Inspection / Sewer Camera / Cleaning
- □ Underground / Aboveground Storage Tank (UST/AST) Removal / Demolition /
- Soil Excavation / Closure
- □ Vapor Intrusion Assessments / Risk Mitigation / Design / Installation / O&M Services

### ARTICLE 3: PROJECT LOCATION

Identify the regions where your firm can most efficiently provide services. Assignments may vary from the regions checked, depending on the specialties and services required.

- □ Western Upper Peninsula (west of Marquette)
- □ Eastern Upper Peninsula (east of Marquette)
- □ Northern Lower Peninsula (north of Grayling)
- □ Saginaw Bay area (east of 127, north of I-69 and M 57, south of Grayling)
- U Western Lower Peninsula (west of 127, north of Muskegon, south of Grayling)
- Central Lower Peninsula (east of Battle Creek, west of Chelsea, south of M 46 and M 57)
- □ Southwestern Lower Peninsula (west of Battle Creek, south of Muskegon)
- □ Southeastern Lower Peninsula (east of Chelsea, south of I-69)

### **ARTICLE 4: CONTRACT UNDERSTANDING**

The following items should be addressed on the assumption that your firm is awarded an Indefinite-Scope, Indefinite-Delivery contract. (See attached sample contract).

4.1 Is it understood that your firm is required to respond to small projects (less than \$25,000) as well as larger projects?

Yes □ No □

4.2 Is it understood that there is no guarantee of any work under this contract?

Yes □ No □

4.3 Is it understood that your firm will be required to execute the attached standard State of Michigan contract language for professional services?

Yes 🗆 No 🗆

4.4 Is it clearly understood that professional liability insurance is required at the time of execution of the ISID contract? (See Article 5 of the attached Sample Contract.)

Yes 🗆 No 🗆

4.5 Is it understood that your firm must comply with State of Michigan law as it applies to your services?

Yes □ No □

4.6 Does your firm have prior experience working with the State of Michigan?

Yes □ No □

If yes, explain: Click or tap here to enter text.

### ARTICLE 5: CAPACITY AND QUALITY

5.1 Briefly describe your firm's methods and procedures for quality control for your deliverables and services.

Click or tap here to enter text.

5.2 Has your firm been involved in claims or suits associated with professional services errors and / or omissions?

Yes □ No □

If yes, explain: Click or tap here to enter text.

5.3 Will there be a key person who is assigned to a project for its duration?

Yes 🗆 No 🗆

5.4 Please present your understanding of the relationship between your firm, the DTMB Design and Construction Division, and the State Agency for whom a project will be completed.

Click or tap here to enter text.

5.5 Describe your approach if a bidder proposes a substitution of a specified material during bidding.

Click or tap here to enter text.

5.6 Describe your approach if a contractor proposes a substitution of a specified material or detail with shop drawing submittals or in construction.

Click or tap here to enter text.

5.7 How will your firm provide consistent and continuous communication pertaining to project activities and project status to the State of Michigan during the progress of projects?

Click or tap here to enter text.

5.8 Does your company have an FTP or similar site for quick posting and distribution of information, drawings, field inspection reports, and other communications?
 Yes □ No □

5.9 Describe your method of estimating construction costs and demonstrate the validity of that method.

Click or tap here to enter text.

5.10 Describe your approach to minimizing construction cost over-runs.

Click or tap here to enter text.

5.11 What percentage of the construction cost should be devoted to construction administration (office and field)?

Click or tap here to enter text. %

5.12 What portion of the assigned work will be performed with your staff and what portion will be provided by sub-consultants?

Click or tap here to enter text. %

5.13 On a typical project, what would be your response time, from the time receive a project assignment to starting investigation and design work? A typical project might be one involving several disciplines and in the neighborhood of a \$25,000 fee.)

Click or tap here to enter text. Days/Weeks

5.14 How do you assess whether a construction bidder is responsive and responsible?

Click or tap here to enter text.

5.15 Describe your experience with similar ISID contracts.

Click or tap here to enter text.

5.16 Describe your approach to a construction contractor's request for additional compensation for a change in the project scope.

Click or tap here to enter text.

5.17 Is a sample of field activity logs detailing a 1-week period (from one of the three (3) prior experience sites) and a weekly report provided?

□Yes □No

### **ARTICLE 6: PERSONNEL STAFFING**

6.1 Is an organizational chart that includes each person on your project team and their identified roles for a typical assigned project provided?

□Yes □No

6.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of the study or project scope of work:

### Key Personnel 1

Name: Click or tap to enter text Job Title: Click or tap to enter text Labor Classification: Click or tap to enter text College Degree(s): Click or tap to enter text

# Has this individual successfully completed 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

□Yes □No

Key Personnel 2

Name: Click or tap to enter text

Job Title: Click or tap to enter text

Labor Classification: Click or tap to enter text

College Degree(s): Click or tap to enter text

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? □Yes □No

### Key Personnel 3

Name: Click or tap to enter text Job Title: Click or tap to enter text Labor Classification: Click or tap to enter text College Degree(s): Click or tap to enter text

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? □Yes □No

### Key Personnel 4

Name: Click or tap to enter text Job Title: Click or tap to enter text Labor Classification: Click or tap to enter text

College Degree(s): Click or tap to enter text

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? □Yes □No

### Key Personnel 5

Name: Click or tap to enter text Job Title: Click or tap to enter text Labor Classification: Click or tap to enter text College Degree(s): Click or tap to enter text

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? □Yes □No

6.3 Does the Professional Project Manager (PM) have at least three years' experience as a PM? □Yes □No

6.4 Does the Professional PM have a minimum of 10 years' experience with similar projects?  $\Box$ Yes  $\Box$ No

6.5 Are the resumes for the key personnel provided? □Yes □No

### **ARTICLE 7: SPECIAL FACTORS**

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. that would pertain to this RFP. (As examples: any awards or recognition received by the firm or individuals for similar work, special approaches or concepts developed by the firm appropriate to this project, financial capacity, etc. Respondents may say anything they wish in support of their qualifications). Click or tap here to enter text.

### **ARTICLE 8: EXPERIENCE**

8.1 Provide a client reference and brief descriptions of **at least three (3) projects in the last five years closely related to each of the project types** and professional services requested in this RFP. Emphasis shall be placed on recent work at sites of environmental contamination:

### Project 1 Reference Information

Project Name: Click or tap to enter text Project Address: Click or tap to enter text Key Personnel: Click or tap to enter text Project City / State / Zip: Click or tap to enter text Contact Name / Phone Number / Email Address: Click or tap to enter text Project Description: Click or tap to enter text Project 2 Reference Information

# Project Name: Click or tap to enter text

Project Address: Click or tap to enter text

Key Personnel: Click or tap to enter text

Project City / State / Zip: Click or tap to enter text

Contact Name / Phone Number / Email Address: Click or tap to enter text

Project Description: Click or tap to enter text

### **Project 3 Reference Information**

Project Name: Click or tap to enter text Project Address: Click or tap to enter text Key Personnel: Click or tap to enter text Project City / State / Zip: Click or tap to enter text Contact Name / Phone Number / Email Address: Click or tap to enter text Project Description: Click or tap to enter text

### GUIDELINES FOR POSITION CLASSIFICATIONS

The Professionals are required to use the following guidelines as the basis for classification of personnel to be assigned under their contracts. Changes in the key personnel under the contract must be done by Contract Modification. In addition, the Professionals must provide with their modification requests the names, hourly billing rates, and resumes for the new **Key Personnel** to be added to the contracts. A Key Personnel is any staff member of the Professional who is essential for the successful completion of the Project scope of work and authorized to make decisions affecting the work at the sites under the contracts.

### 1. PROFESSIONAL KEY PERSONNEL

A. Level 4 (P4) - Plans, conducts, and supervises projects of major significance, necessitating proven managerial skills and knowledge of hazardous waste sites. Must demonstrate ability to originate and apply new and/or unique methods and procedures. Supplies technical advice and council to other professionals. Generally, operates with wide latitude for independent action.

### Typical Title:

National Manager, Project Leader, Chief Engineer, or Scientist.

### Qualifications and Experience:

Ph.D. degree with 10 years or more experience.

MS degree with 12 years or more experience.

BS degree with 14 years or more experience.

### Experience Factors:

Technical experience in discipline directly related to the requirements of this contract. Minimum of 4 years' experience in supervising multidisciplinary professionals and general office management including budgetary requirements.

B. Level 3 (P3) - Under general supervision of P4 Manager, plans, conducts and supervises assignments on a project- by-project basis. Estimates and schedules work to meet completion dates. Directs assistance, reviews progress and evaluates results; makes changes in methods, design or equipment are made where necessary. Responsible for safe and cost-effective approaches to achieve the objectives of the project.

### Typical Title:

Regional Team Leader, Project Engineer.
#### Qualifications and Experience:

Ph.D. degree with 4 to 10 years' experience MS degree with 6 to 12 years' experience BS degree with 8 to 14 years' experience

#### Experience Factors:

Technical experience in disciplines directly related to the requirements of this contract. Minimum of 4 years' experience or equivalent. Must have demonstrated ability to manage group of interdisciplinary professionals.

#### 2. PROFESSIONAL NON-KEY PERSONNEL

A. Level 2 (P2) - Under supervision of a senior or project leader, carries out assignments associated with projects. Work assignments are varied and require some originality and ingenuity. Applies training of professional discipline to assigned projects and translates technical guidance and training received into usable data products and reports. Evaluates data associated with various watersheds for use in developing digital flood insurance map production and development of updated flood data.

#### Typical Title:

Surveyor, Engineer, Construction Manager, Project Manager, Scientist, Analyst

Qualifications and Experience:

MS degree with 2 to 6 years' experience.

BS degree with 3 to 8 years' experience.

#### Experience Factors:

Minimum of 2 years in area directly related to contract requirements.

B. <u>Level 1</u> (P1) - Entry level for professional classification; works under supervision of team or project leader. Gathers and correlates basic data and performs routine tasks and other duties as assigned. Makes recommendations on work assignments and on variables which affect field operations. Assists field operations as directed, including manual tasks of equipment setup and maintenance. Performs other duties as assigned.

#### Typical title:

Junior Associate (Surveyor, Engineer, Scientist, Geologist, etc.)

#### Qualifications and Experience:

MS degree with 0 to 2 years' experience.

BS degree with 0 to 3 years' experience.

Experience Factor: None

#### 3. TECHNICIAN NON-KEY PERSONNEL

A. Level 3 (T3) - Performs non-routine and complex assignments. Works under general supervision of a surveyor, scientist or engineer. Performs experiments or tests which may require non-standard procedures and complex instrumentation. Records, computes and analyzes test data, prepares test reports. May supervise lower level technicians or trades personnel.

Typical Title:

Senior Technician

**Qualifications and Experience:** 

6 years or more experience.

Experience Factor:

Related to scope of contract.

B. <u>Level 2</u> (T2) - Performs non-routine and complex tasks in addition to routine assignments. Works at the direction of the team or project leader. Gathers and correlates basic data and performs routine analyses. May also perform experiments or tests which may require non-standard procedures and complex instrumentation. May construct components or sub-assemblies or prototype models. May troubleshoot malfunctioning equipment and make simple repairs as authorized by team or project leader.

Typical Title:

Senior Technician

Qualifications and Experience:

Two to six years' experience or equivalent

Experience Factor:

Related to scope of contract.

C. Level 1 (T1) - Entry level; performs simple, routine tasks under supervision as established in chain-of- command procedures. Performs routine maintenance and may install, set up or operate field equipment of moderate complexity. Provides a wide variety of support functions during field operations.

Typical Title:

Junior Technician (field technician)

Qualifications and Experience:

0 to 2 years' experience.

Experience Factor:

None

#### 4. TECHNICAL SUPPORT (TS) NON-KEY PERSONNEL

Performs project specific technical support work such as spreadsheet preparation, data entry, etc.

Typical Title:

Project Assistant, Data Entry Clerk, etc.

**Qualifications and Experience:** 

0 to 2 years or more

### POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION

### PROFESSIONAL SERVICES - 2023 ENVIRONMENTAL ISID

Firm Name \_\_\_\_\_\_ Yearly Percentage Billing Rate Increase\_\_\_\_\_\_

\_

LEVEL	CLASSIFICATION	]				
		Year	Year	Year	Year	Year
		2023	2024	2025	2020	2027
_	_		_	_	_	

\*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate Calculation," and the attached "Sample Standard Contract for Professional Services," Article II, Compensation.

\*\* Key Project Personnel

COST OR PRICE SUMMARY       Form appro         OMB No. 2       Approval e.         (see accompanying instructions before completing this form)       Approval e.							
	í		/				
1. RECIPIENT 2. ASSISTANCE IDENTIFICATION N							
3. NAME CONTRACTOR OR SUBCONTRACTOR 4. DATE OF PROPOSAL							
5. ADDRESS OF CONTRACTOR OR SUBCONTRACTOR (Include ZIP Code) 6. TYPE OF SERVICE TO BE FURNISHE							
TELEPHONE NUMBER(Include Area Code)							
PART II - COST SUMM	IARY	,					
7. DIRECT LABOR (specify labor categories)	EST H	IMATED OURS	HOURLY RATE	ESTIMATED COST	TOTALS		
			\$	\$			
DIRECT LABOR TOTAL:				ESTIMATED	\$		
8. INDIRECT COSTS (Specify indirect cost pool)	R	RATE	x BASE =	COST			
				•			
INDIRECT COSTS TOTAL:					\$		
9. OTHER DIRECT COSTS							
a. TRAVEL				COST			
(1) TRANSPORTATION				\$			
(2) PER DIEM				\$			
TRAVEL SUBTOTAL:				\$			
b. EQUIPMENT, MATERIALS, SUPPLIES (Specify categories)	(	QTY	COST	COST			
			φ	φ			
EQUIPMENT SUBTOTAL:							
c. SUBCONTRACTS ESTIMATED COST							
				\$			
SUBCONTRACTS SUBTOTAL:				\$			
d. OTHER (Specify categories)				COST			
			1	Ψ	1		
OTHER SUBTOTAL:				\$			
e. OTHER DIRECT COSTS TOTAL:					\$		
10.TOTAL ESTIMATED COST					\$		
11. PROFIT							
					φ		

	PART III - PRICE SUMMARY		
13. COMPETITOR'S CATALO	G LISTINGS, IN-HOUSE ESTIMATES, PRIOR QUOTES		PROPOSED
(max			TRIOL
			-
			-
			1
			-
			-
			1
			\$
	PART IV - CERTIFICATIONS		
14 CONTRACTOR			
14a. HAS A FEDERAL AGENCY OR FEDERA RECORDS IN CONNECTION WITH ANY	OTHER FEDERAL ASSISTANCE AGREEMENT OR CONTRACT W	EVIEW OF YOUR A	CCOUNTS OR 2 MONTHS2
YES NO (If "Yes" give name,	address, and telephone number of reviewing office)		
14b. THIS SUMMARY CONFORMS WITH TH	E FOLLOWING COST PRINCIPLES		
14c. This proposal is submitted for use in conn	ection with and in response to:		
(1)			
This is to certify to the best of my knowled	ge and belief that the cost and pricing data summarized herein are	(2) [	DATE
complete, current, and accurate as of:			
I futher certify that a finacial management understand that the subagreement price n	capability exists to fully accurately account for the finacial transaction hav be subject to downward renegotiation and/or recomment where the	s under this project.	I further certify that I
determined, as a result of audit, not to have	e been complete, current, and accurate as of the date above.		ionig data have zee.
(3) TITLE OF PROPOSER	SIGNATURE OF REVIEWER	DAT	TE OF EXECUTION
15. RECIPIENT REVIEWER			
I certify that I have reviewed the cost/price	summary set forth herein and the proposed cost/price appear accept	able for subagreeme	nt award.
	SIGNATURE OF REVIEWER	DAT	IE OF EXECUTION
16. EPA REVIEWER			
	SIGNATURE OF REVIEWER	DAT	IE OF EXECUTION

#### PURPOSE AND APPLICABILITY

The purpose of this form is to provide a simple form for the display of cost and price data. 40 CFR 33.290 requires the recipient to perform cost or price analysis for every procurement action, including subagreement modifications. This form is not required by EPA, but may be used at the recipient's option. If the recipient currently uses a cost and price analysis form which accomplishes the same objectives as this form, the recipient may use its own form.

#### INSTRUCTIONS

If this form is used, CAREFULLY READ AND FOLLOW ALL INSTRUCTIONS. Many items are not self-explanatory. Attach additional sheets if necessary.

Use only the applicable portion of this form:

Part I is applicable to all subagreements.

Part II is applicable to all subagreements requiring a cost analysis pursuant to EPA procurement regulations.

Part III is applicable to all subagreements where review is based on price comparison (i.e., price analysis).

Part IV certification will be executed as required by the instructions for each block.

#### PART I - GENERAL

**Item 1** - Enter the name of the of the recipient as shown on the assistance agreement.

**Item 2** - Enter the assistance identification number shown on the assistance agreement (or assigned to the project, if no assistance agreement has yet been executed).

**Item 3** - Enter the name of the contractor or subcontractor with whom the subagreement is proposed to be executed.

**Item 4** - Enter the date of the contractor's or subcontractor's proposal to the recipient.

**Item 5** - Enter the full mailing address of the contractor or subcontractor. **Item 6** - Give a brief description of the work to be performed under the proposed subagreement.

#### Part II - COST SUMMARY

This portion of the form is to be completed by the contractor (or his/her subcontractor) with whom a subagreement is a formally advertised, competitively bid, fixed price subagreement.

Nothing in the following discussion should be interpreted as recommending the inclusion as direct costs any items normally treated as overhead costs in the firm's accounting or estimating system. 40 CFR Part 30 identifies general cost principles applicable to subagreements under EPA assistance. Pursuant to that Part, all subagreements awarded to profit-making organizations are subject to cost principles of 48 CFR 31.2. Architect engineer and construction contracts are also subject to 48 CFR 31.105.

#### Item 7 - Direct Labor

Direct labor costs normally include salaries at a regular time rate. Overtime premiums should be identified separately on an attachment. Incurrence of unanticipated overtime costs requires the approval of the recipient at the time of incurrence. If significant overtime is known to be needed at the time of completion of the cost review form, the reasons therefore, labor categories, rates and hours should be identified on the attachment. Also included is the cost of partners' or principals' time when they are directly engaged in services to be rendered under the subagreement. In case the full time of any employee is not to be devoted to work to be performed under the subagreement, only the cost of actual time to be applied should be included. The compensation of a partner or principal shall be included as direct cost only for the time that she/he is expected to be engaged directly in the performance of work under the subagreement and only if it is the firm's normal practice to charge such time directly to all jobs. The rate of compensation of a partner or principal shall be commensurate with the cost of employing another qualified person to do such work, but the salary portion shall not exceed the actual salary rate of the individual concerned. Distribution of profits shall not be included in the rate of compensation.

Enter in block 7 the categories of professional or technical personnel necessary to perform each major element of work under the subagreement scope of services. Estimate hours worked for each category and extend them by the wage rates to be paid during the actual performance of the work. Current rates, adjusted for projected increases, if any should be useful for the actual categories of labor contemplated. All projected increases should be supported by recent experience or established personnel policy. Enter in the far right column the total estimated direct labor cost.

Supporting records to be maintained by the contractor and which must be submitted or made available to the recipient or EPA upon request include:

a. The method of estimating proposed hours worked.

b. The computation techniques used in arriving at proposed labor rates.c. The specific documents, books or other records used as factual source material to develop proposed hours worked and labor rates.

d. Detailed rate computations which were used in computing the information submitted on the form.

If in block 14a, the contractor has checked "No," a brief narrative description of the methods used in arriving at items a though d above shall be included on an attached sheet.

#### **Item 8- Indirect Costs**

Indirect cost may consist of one or more pools of expenses which are grouped on the basis of the benefits accruing to the cost objectives represented by the distribution base or bases to which they are allocated. Since accounting practices vary, the use of particular groupings is not required. Neither is the use of any particular allocation base mandatory. However, it is mandatory that the method used results in an equitable allocation of indirect costs objectives which they support.

Normally, the firm's accounting system and estimating practices will determine the method used to allocate overhead costs. The firm's established practices, if in accord with generally accepted accounting principles and PROVIDED THEY PRODUCE EQUITABLE RESULTS IN THE CIRCUMSTANCES, will generally be accepted. Proposed overhead rates should represent the firm's best estimate of the rates to be experienced during the subagreement period. They should be based upon recent experience and be adjusted for known factors which will influence experienced trends.

Common overhead groupings are overhead on direct labor and general and administrative expenses. The first groupings usually include employment taxes, fringe benefits, holidays, vacation idle time, bonuses, applicable and direct labor, etc. The second generally includes the remaining costs, which, because of their incurrence for common or joint objectives, are not readily subject to treatment as direct costs. It is expected, however, that proposal groupings will correspond with the firm's normal method for accumulating indirect costs. (Under some accounting systems, the first grouping would be included instead under item 7.) No special categorization is required, provided the results are realistic and equitable.

Direct salaries are the normal distribution base for overhead cost but in some circumstances other bases produce more equitable results. As in the case of overhead cost groupings, the method to be used will depend upon the firm's normal practices and the equity of the results produced in the circumstances.

In the case of multibranch firms, joint ventures, or affiliates, it is expected that overhead costs applicable to specific location(s) where

work is to be based on cost data from the most recent fiscal periods updated to reflect changes in volume of business or operations.

Enter in block 8 the indirect cost pools normally used by the firm for allocation of indirect costs. Enter indirect cost rate for each pool and extend each one by the rate base to which it applies to arrive at the estimated indirect costs to be incurred during the actual performance of the work. If the indirect labor total from block 7 is not used as the rate base for any of the indirect cost pools, the rate base used must be explained on an attached sheet.

A brief narrative statement outlining the firm's policies and practices for accumulating indirect costs. Enter the indirect cost rate costs and the method used to compute the proposed rate or rates shall accompany the form. Include comment on the firm's policies regarding the pricing and costing of principals' time. The normal accounting treatment of principals' salaries, the annual amounts, and the hourly charge rate, if used, should be discussed.

Enter in the far right column the total estimated indirect costs.

Supporting records to be maintained by the contractor and which must be submitted or made available to the recipient or EPA upon request include:

a. Detailed cost data showing overhead accounts, allocation bases, and rate computations for the preceding fiscal period. If more than six months of the current fiscal period have elapsed, cost data for this period should be included as one of the three period(s).

b. Company budgets, budgetary cost data and overhead rates computations for future period(s).

#### Item 9 - Other Direct Costs

The following items are illustrative of costs normally included in this category of costs:

a. Travel cost, including transportation, lodging, subsistence, and incidental expenses incurred by personnel or consultants while in travel status in connection with the performance of services required by the contract. The cost principles generally require the use of less than first class air accommodations and also limit the cost of private aircraft.

#### b. Equipment, Materials, and Supplies

(1) Long distance telephone calls, telegraph and cable expenses to be incurred in connection with the performance of services required in connection the subagreement.

(2) Reproduction costs, including blueprints, black and white prints, ozalid prints, photographs, photostats, negatives; and express charges.

- (3) Commercial printing, binding, artwork, and models.
- (4) Special equipment.
- c. Subcontractors
- d. Other Direct costs, if any, not included above.

Enter in blocks 9a-d all other direct costs proposed. Travel costs entered must be supported by an attachment which identifies the number of staff trips proposed and the estimated cost per staff trip for both local and long distance transportation. The number of days and the rate per day must be provided to support the per diem shown. Each subcontract and consultant agreement must be identified separately in block 9c.

Enter in the far right column on line 9e the total of all other direct costs (9a-d).

Supporting data to be maintained by the contractor and which must be submitted or made available to the recipient or EPA upon request include:

a. basis for other direct costs proposed.

b. factual sources of costs, rates, etc., used in computing proposed amount of each cost element.

#### Item 10 - Total Estimated Cost

Enter the total of all direct labor, indirect costs and other direct costs from items 7, 8, and 9.

#### Item 11 - Profit

A fair and reasonable provision for profit cannot be made by simply applying a certain predetermined percentage to the total estimated cost. Rather, profit will be estimated as a dollar amount after considering:

- a. degree of risk.
- b. nature of the work to be performed.
- c. extent of firm's investment.
- d. subcontracting of work, and
- e. other criteria.

The Federal Acquisition Regulation cost principles applicable to subagreements with profit-making organizations (40 CFR 31.2 and 31.105) disallow certain types of costs which are sometimes incurred by firms in the normal conduct of their business. Examples of costs which are not allowable under these costs principles include, but are not limited to, entertainment, interest on borrowed capital, and bad debits. Because the Government considers "profit" to be the excess of price over allowable costs, such computation can indicate a higher profit estimate that the firm's experienced profit as it customarily computes it. The contractor may separately disclose to the recipient its customary computations.

Enter the dollar amount of profit in block 11.

#### Item 12 - Total Price

Enter the total of items 10 and 11.

#### Part III - PRICE SUMMARY

This portion of the form is for use by a recipient when price comparison, i.e., price analysis, is used subagreement review. It may also be used by a contractor when price comparison is used as a basis for award of a subcontract.

# Item 13 - Competitor's Catalog Listings, In-House Estimates, Price Quotes

Enter sources of all competitive bids or quotes received, or catalogs used and their prices, or in-house estimates made, if appropriate, for comparison. Attach additional sheets if necessary, particularly for purchases of several different items.

Enter in the far right column the proposed price for the subagreement.

#### **Part IV - CERTIFICATIONS**

Item 14 - Contractor - FOR USE BY CONTRACTOR OR SUBCONTRACTOR ONLY.

Complete this block only if part II has been completed.

Enter the specific cost principles with which the costs summary of Part II conforms. Cost principles applicable to subagreements with various types or organizations are identified in 40 CFR Part 30.4010. Cost principles applicable to subagreements with profit-making organizations are those at 48 CFR 31.2 and, for architect-engineer or construction contracts, 48 CFR 31.105.

c. (1) **Describe** the proposal, quotation, request for price adjustment, or other submission involved, giving appropriate identifying number (e.g., RFP No. \_\_\_\_\_).

(2) **Enter** the date when the price negotiations were concluded and the contract price was agreed to. The responsibility of the subagreement is not limited by the personal knowledge of the contractor's negotiator if the time of agreement, showing that the negotiated price is not based on complete, current, and accurate data.

(3) **Enter** the date of signature. This date should be as close as practicable to the date when the price negotiations were concluded and the subagreement price was agreed to (not to exceed 30 days).

Item 15 - Recipient Reviewer - FOR USE BY RECIPIENT ONLY.

If required by applicable assistance regulations, the recipient must submit the signed form for EPA review prior to execution of the subagreement.

Item 16 - EPA Reviewer - FOR USE BY EPA ONLY.

ISID - Environmental (Billing Rate) Indefinite-Scope, Indefinite-Delivery Contract R 02/28/19



## STATE OF MICHIGAN

# DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

This contract authorizes the professional services contractor to provide professional services. (Authority: 1984 PA 431)

### CONTRACT FOR PROFESSIONAL ENVIRONMENTAL SERVICES: Indefinite Scope-Indefinite Delivery

THIS CONTRACT, authorized this DATE day of MONTH the year two-thousand and twenty-three (2023), by the Director, Department of Technology, Management and Budget, BETWEEN the STATE OF MICHIGAN acting through the STATE FACILITIES ADMINISTRATION, DESIGN AND CONSTRUCTION DIVISION of the DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET, 3111 W. St. Joseph Street, Lansing, Michigan, 48917, hereinafter called the Department, and

### PSC NAME MAILING ADDRESS CITY, STATE, ZIP

the Prime Professional Services Contractor, hereinafter called the

Professional. WHEREAS, the Department proposes securing

professional services for:

#### Indefinite-Scope, Indefinite-Delivery Contract No. 00XXX

Index No. (To Be Established) Contract Order No. Y (To Be Assigned) File No. (To Be Assigned)

Department of Technology, Management and Budget, State Facilities Administration, Design and Construction Division, Professional Environmental Services Indefinite-Scope, Indefinite-Delivery Contract (ISID) for Minor Projects –

#### **2023 Environmental ISID Services**

Various State Departments and Facilities Various Site Locations, Michigan

NOW THEREFORE, the Department and the Professional in consideration of the covenants of this Contract agree as follows:

- The Professional shall provide primary environmental investigation/assessment/design/construction oversight services for the assigned projects to the extent authorized by the Department of Technology, Management and Budget State Facilities Administration (SFA), Design and Construction Division (DCD) [The Department] and be solely responsible for such professional services. The Professional's services shall be performed in strict accordance with the assigned Project scope of work.
- II. If authorized, the Professional shall provide environmental services for the identified project types.

	R	egior	าร						Project Types and Services Offered												
Western UP	Eastern UP	Northern LP	Saginaw Bay	Western LP	Central LP	Southwestern LP	Southeastern LP	Regulated Waste Survey/Abatement	Utility Inspection/Cleaning	Nuclear Waste Mgmt./Disposal/Remediation	GPR/LIF Field Screening	Phase I/Phase II/BEA	Well Drilling/Abandonment	Env Investigation/Pilot Tests/Feasibility Study	UST & AST removal/Demolition/Excavation	Remediation Sys Design/O&M/Decommissioning	Vapor Intrusion Mitigation Design and O&M	Ecological RA/Forestry/Wetland/Streams/Lakes	Landfill Maintenance/Monitoring	Brownfield Development	Per-& Polyfluoroalkyl Substances (PFAS) Sampling
X	X	X	X	X	x	X	X	x	X	x	X	X	x	X	X	x	X	X		X	x

NOTE: Blackened box(es) indicate a service that the committee did not select for your firm.

III. The State of Michigan shall compensate the Professional for providing their professional services for the Project in accordance with the conditions of this Professional Services Contract.

IN WITNESS, WHEREOF, each of the parties has caused this Professional Services Contract to be executed by its duly authorized representatives on the dates shown beside their respective signatures, with the Contract to be effective upon the date on which the Professional received a copy executed by the authorized State of Michigan representative(s) by regular, registered, or certified mail or by delivery in person.

#### FOR THE PROFESSIONAL:

Firm Name	SIGMA Vendor ID Number
Signature	Date
Title	
FOR THE STATE OF MICHIGAN:	
Director, DTMB   SFA   Design and Construction	Date

WHEREAS, this Professional Services Contract constitutes the entire agreement as to the Project between the parties, any Contract Modification of this Contract and the Department's approved and attached Project/Program Statement scope of work requirements must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the State may require. No Contract Modification may be entered into to compensate the Professional for correcting, or for responding to Professional claims or litigation for. the firm's final design Contract Documents/architectural and engineering design errors, omissions or neglect on the part of the Professional.

#### ARTICLE I PROFESSIONAL SERVICES SCOPE OF WORK

Provide professional environmental services, technical staff, and support personnel for ISID minor projects on an as-needed basis at various State/Client Agencies within the various site location areas as defined by the State of Michigan.

This Contract is for professional environmental investigation and/or design services for an unspecified number of ISID projects ("Assignment"). The scope of work for each assigned project will be defined at the time the project is awarded by the State to the Professional firm. The professional environmental services required for each of these assigned projects requested by the Department may include any or all of the Tasks included in the Phase 100 – Study through the Phase 900 – Operation and Maintenance Management.

The Professional firm's environmental services shall be performed in strict accordance with this Professional Services Contract and be in compliance with the Department's approved and attached Appendix I– Project/Program Statement.

This Contract does not warrant or imply to the Professional environmental firm, entitlement to perform any specific percentage (%) amount of environmental work during the life of this Contract.

This Contract will remain in effect for **three (3) years** from the date of this Contract award but may be unilaterally terminated by the State of Michigan at any time, for cause or its convenience, by written notification of the State, to the Professional. Furthermore, this Contract may be extended for **one (1) additional year**, at the sole option and discretion of the State upon the Department providing written notice to the Professional prior to the expiration of the original Contract time period. Any such time extension shall be subject to the terms and conditions of this Contract, including, but not limited to, the existing hourly billing rates included in this Contract for the Professional, their Consultant, and their employees or agents.

Please note that the Professional Services Contract ISID Contract No., as noted on page 1, must be provided on all Project correspondence and documents. Also, services are not to be provided or expenses incurred until individual ISID Projects are assigned to this Contract (see the Article II – Compensation and the Appendix 1 – Project/Program Statement).

Upon award of this Contract and each subsequent assignment, the Professional understands and agrees that time is of the essence. Failure to adhere to timely completion will be grounds for the Department, at its sole discretion, to terminate or limit future work under this Contract.

The Professional shall provide all professional services, technical staff, and support personnel necessary to complete the Project as described in its Project/Program Statement, in the best interest of the State, and within the Professional's fee(s) herein authorized by the State. Assigned project services shall comprise, without exception, every professional discipline and expertise necessary to meet all the requirements as described in the Project/Program Statement and in accordance with the accepted industry standards for professional practice and services. The Professional's services include attendance at all Project related meetings and conferences. Professional services for the assigned projects under this contract shall be provided in the Phase/Task. sequence shown below and shall be rendered in accordance with the Professional's proposed and approved Project Study, Design, and Proposed Construction Schedule. The Professional's study, design, and proposed construction schedule shall be detailed, undated, and time sequence related for all Phase/Task services appropriate for the Project. The Professional shall field-check and verify the accuracy of all study/drawing and any data furnished by the Department, the State/Client Agency or any other Project related source. The Professional shall not employ or consult with any firms in completing the Professional's obligations herein who it anticipates will be a construction Bidder for the Project or any part thereof, unless specifically authorized, in writing, by the Department.

The Professional acknowledges that the Department is the first interpreter of the Professional's performance under this Contract.

The Professional acknowledges by signing this Professional Services Contract having a clear understanding of the requested professional environmental services required by the Department, and further agrees that the terms and conditions of this Professional Services Contract provide adequate professional fee(s) for the Professional to provide the requested Project scope of work requirements for each assigned project. No increase in compensation to the Professional will be allowed unless there is a material change made to the scope of work of the Assignment/Program Statement and the change is accepted and approved, in writing, by the State. Professional services shall not be performed, and no Project expenses shall be incurred by the Professional prior to the issuance of a written and signed Professional Services Contract and a Contract Order authorizing the Professional to start the Project work. Compensation for Department directed changes to the Project will be provided to the Professional by a Contract Modification and/or Contract Change Order signed by the Department and the Professional. The preparation of Bulletins and Contract Change Orders resulting from changes in the Project scope of work or previously unknown on-site field conditions will be compensated to the Professional, as approved by the Project Director/Agency Project Manager, on an hourly billing rate basis in accordance with this article. This compensation shall not exceed seven and half percent (7.5%) of the Construction Contractor's guotation for the Bulletin or Contract Change Order or an amount mutually agreed upon by the Professional and the Project Director/Agency Project Manager.

The Professional shall immediately inform the Department whenever it is indicated that the Professional's authorized not-to-exceed Budget for any of the assigned Projects may be exceeded. The Professional shall make recommendations to the Department for revisions to be implemented in order to not exceed the original authorized Budget. Any revision to the Project must be accepted and approved by the Department in writing.

The professional services may also include participation in legislative presentations as described in the "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" and as the legislature or the Department may prescribe.

No substitution of any "Key Personnel/Employee" essential for the successful completion of the Project and identified in the Professional's Organizational Chart will be allowed by the Professional for this Contract without the prior written consent from the Project Director/Agency Project Manager. Before any "Key Personnel/Employee" substitution takes place, the Professional shall submit a written request to the Project Director/Agency Project Manager, and this substitution request shall include the following information: (1) A request in writing for a No Cost Contract Modification; (2) Detailed written justification for this substitution; (3) The Professional's qualifications of any proposed "Key Principal Personnel/Employee" replacement; and (4) A written statement from the Professional assuring the Department that the Project scope of work will not be adversely affected by this substitution. This request to modify their Professional Services Contract must be accepted and approved in writing by the Project Director/Agency Project Manager and the Director of the Department.

The Department will designate individuals to serve as the Project Director and Agency Project Manager for the Project scope of work who shall be fully acquainted with the Project/Program Statement and have the authority to render Project decisions and furnish information promptly. Except in connection with issues under the Article XII -Contract Claims and Disputes text, the Project Director/Agency Project Manager will exercise general management and administration for the Professional's services in so far as they affect the interest of the State. The Professional shall indemnify, defend, and hold harmless the State against exposure to claims arising from delays, negligence, or delinquencies by the Professional for the professional services of this Contract.

During the Construction Administration Services Phase of the Project, the Professional is required to complete and submit, the on-site inspection record form, "DTMB-0452, The Professional's Inspection Record," for all on-site inspection visits to the Project site. The Inspection Record shall be completed and signed by the Professional and submitted monthly, with the original document sent to the Project Director/Agency Project Manager and copies sent to the Construction Contractor. The Inspection Record shall accompany the Professional's monthly payment request.

The "DTMB-0460, Project Procedures" contains Department forms which shall be used during the Construction Administration Phase of this Contract. All professional services will be consistent with the Department's current "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" unless otherwise approved in writing by the Department.

The professional services required for each Phase of this Contract shall be performed by the Prime Professional and their Consultants in accordance with service descriptions in this article. The following service descriptions outlined in this Contract represent the Department's standard of care for the Professional's responsibilities for providing the professional services of this Contract; but by inclusion, or omission, the descriptions do not limit or exclude any regular or normal professional services necessary to accomplish the Project in accordance with the approved Project Budget and the industries accepted practice and standards for professional services. All of the services outlined in this Contract may not be applicable to the Project/Program Statement. The Professional shall determine and coordinate the interface of the services required for the Project and is responsible for identifying any additional services necessary to successfully complete the Project.

The professional shall execute the following PHASES upon written authorization from the Project Director.

#### PHASE 100 - ENVIRONMENTAL INVESTIGATION/STUDY SERVICES

Provide complete and comprehensive Environmental Investigation/Study Deliverables to meet the requirements of the Project/Program Statement. Upon completion of all field investigation, assessment, research, review and/or oversight, prepare a complete report with an executive summary, and in such detail, as the Project Director may prescribe. The services under this phase may include but not be limited to coordination, environmental assessments, drilling, field sampling/oversight, data/document review/management, feasibility study, and reporting as described in the Project/Program Statement. Project reports must be in accordance with Department/Client/Agency requirements and as outlined in the Project/Program Statement but shall include, as a minimum and as appropriate, the following items: (1) Problem; (2) Conclusion; (3) Recommendations; and (4) Discussion, details, and documentation.

#### PHASE 300-SCHEMATIC DESIGN

Prepare Schematic Design Deliverables consistent with the Project/Program Statement. The deliverables shall consist of conceptual remediation system, drawings, outline specifications, a Schematic Construction Cost Estimate, other related documentation, and shall diagrammatically depict the areas, scales, and relationships of the functions. The services under this phase may include but not be limited to coordination, construction codes and design reviews, civil/site staging investigation, schematic design and utilities review, drafting, and project cost/proposed construction schedule, as required by the Department/Client/Agency and as outlined in the Project/Program Statement. Acceptance of the Schematic Design by the Department/Client/Agency does not limit subsequent inclusion of minor, but essential, schematic or design details whose necessity and arrangement may best become apparent during subsequent Phases of the Project design. Revise design as necessary and obtain approval from the Department/Client/Agency.

#### PHASE 400–DESIGN DEVELOPMENT

Prepare Design Development Deliverables based on the Owner-accepted Schematic Design to depict the intent of the designed remediation system(s). The deliverables shall consist of draft drawings and specifications, Construction Cost Estimates and other related documentation to clearly establish the complete basis for further detail into final design drawings/specifications. The deliverables shall further define the Project by fixing and describing the Project size, character, site relationships, and other appropriate elements including the environmental, civil, structural, architectural, mechanical, electrical, and safety systems. The services under this phase may include but not be limited to coordination, draft drawings/specifications, site specific staging investigation, structural calculations and preliminary environmental/architectural/engineering design development/reviews of drawings/specifications, as required by the Department/Client/Agency and as outlined in the Project/Program Statement.

#### PHASE 500-CONSTRUCTION DOCUMENTS AND BIDDING DOCUMENTS

Prepare Construction Documents that revise, refine, amplify, and depict, in detail, the Project. The documents shall set forth, in detail, guality levels of and requirements for the construction, and shall consist of final drawings/specifications that comply with applicable regulatory and construction code requirements, enacted at the time of completion of the one hundred percent (100%) Construction Documents. Prepare Bidding Documents in Phases/Bid packages appropriate to the Project requirements and funding. Incorporate the current edition of DTMB "MICHSPEC", "DCSPEC" or "50KSPEC", as adopted and modified by the State of Michigan. The Construction Documents shall contain all information necessary to bid and construct the Project. The services under this phase may include but not be limited to coordination, final drawings/specifications and bidding documents, civil/site staging design, final structural calculations, final environmental/architectural/engineering design development/reviews of drawings/specifications, construction testing program, hazardous materials, health and safety risks, final design correction procedures, design and construction budget, construction codes/permits and construction schedule, as required by the Department/Client/Agency and as outlined in the Project/Program Statement.

#### PHASE 600 - CONSTRUCTION ADMINISTRATION - OFFICE SERVICES

Provide all required construction oversight administration and timely professional review and administrative services, as the circumstances of the Construction may require, allowing the successful review/implementation of the Construction Documents into a completed remedial actions/abatement measures and/or for the use intended by the Department/Client/Agency. The services under this phase may include but not be limited to coordination, review and approval of shop drawings and submittals, reporting of construction progress, construction quality testing, construction contractor performance review, punch list procedures, claims, establishing close-out procedures and developing/review of as-built documents, as required by the Department/Client/Agency requirements and as outlined in the Project/Program Statement.

#### PHASE 700 - CONSTRUCTION ADMINISTRATION - FIELD SERVICES

Provide all required Construction Oversight and Field Services, including timely inspection and professional services, as the circumstances of the Construction may require, allowing the successful review/implementation of the Construction Documents into a completed remedial action/abatement measures and/or for the use intended by the Department/Client/Agency. The services under this phase may include but not be limited to coordination, field inspections, progress meetings and final project inspection, as required by the Department/Client/Agency requirements and as outlined in the Project/Program Statement.

#### PHASE 900 - OPERATION AND MAINTENANCE SERVICES - REMEDIATION FACILITY

Provide all required Operation and Maintenance (O&M) Services and perform, in a safe and secure environment, all functions, including timely inspection, sampling and professional services, necessary to maintain uninterrupted, effective and efficient facility/system components for the use intended by the Department/Client/Agency. The services under this phase may include but not be limited to coordination, general system operation/inspections, routine system/building/ground maintenance, sampling, spare replacement parts, consumable supplies, utilities. waste materials removal/treatment/disposal, non-routine emergency services, progress meetings and reporting, as required by the Department/Client/Agency requirements and as outlined in the Project/Program Statement.

### ARTICLE II COMPENSATION

In consideration of the performance of this Contract, the Department agrees to pay the Professional, as compensation for professional services, an hourly billing rate for each employee providing a direct service to this Project, on a not-to-exceed basis as specified herein, subject to subsequent modifications mutually agreeable to the parties hereto; provided, however, the Professional may not incur costs, or bill the Department, for professional services in excess of the estimates established for this Project without the prior written agreement of the Department. The attached proposal prepared by the Professional in response to the Request for Proposal, by the Owner, may describe methodology, services, schedule, and other aspects of the work to be performed under the Contract but does not supersede the Contract.

Compensation to the Professional shall be on an hourly billing rate basis for professional services rendered by salaried and non-salaried professional, technical, and technical support employees, except for any authorized reimbursable expenses provided for in this Contract. Total compensation for any Phase shall not exceed the amount authorized for that Phase, unless authorized in writing by the Department's approved Contract Change Order. Professional services shall not be performed, and no Project expense shall be incurred by the Professional firm prior to the issuance of a written and signed Professional Services Contract and a DTMB Form 0402 - Contract Order by the Department to the Professional, authorizing the Professional to start the Project.

Compensation to the Professional for services and authorized technical and technical support employees performing a direct service for this Project shall be determined using the Professional firm's billing rates. The Professional firm's hourly billing rate shall be the actual amount paid for the employee services on the Project including fringe benefits, vacations, sick leave, other indirect costs, and profit. The Professional firm's hourly billing rates shall not change during the life of this Contract without written approval by the Department. See attached Appendix, **Overhead Items Allowed for the Professional Services Contractor Firm's Hourly Billing Rate Calculation**, for the guide to overhead items allowed for the professional services contractor firm's hourly billing rate calculation. Reimbursement for the Project/Program Statement scope of work requirements will be provided only for Department approved items authorized for reimbursement compensation in this Contract. The State will not reimburse the Professional for downtime, or for personnel involved in downtime due to mechanical problems or failure of Professional's or Subcontractor equipment.

The preparation of Bulletins and Contract Change Orders resulting from changes to the Project scope of work or previously unknown on-site field conditions will be compensated to the Professional, as approved by the Department on an hourly billing rate basis in accordance with this article. This compensation shall not exceed seven and one- half percent (7.5%) of the Construction Contractor's quotation for the Bulletin or Contract Change Order or an amount mutually agreed upon by the Professional and the Project Director/Agency Project Manager.

The Professional shall provide, but no additional monetary compensation shall be allowed for the services necessary to respond to and resolve all claims arising wholly or in part from the Professional's errors and/or omissions or other aspects of the Project's design or the Professional firm's performance which is inconsistent with the Professional or Construction Contract.

- 2.1 PREMIUM TIME/OVERTIME: This Contract anticipates that no premium or overtime is required to achieve the Project's scope of work. No compensation will be allowed to the Professional for any premium or overtime cost incurred to achieve the Project schedule of this Contract, unless directed in writing by the Project Director/Agency Project Manager and approved by the Department.
- 2.2 EMPLOYEE HOURLY BILLING RATES: Hourly billing rates will include all direct and indirect monetary costs to the State for the Professional's services under this Contract other than the authorized and approved reimbursements. Hourly billing rates shall be based on the Professional's documented historical operating expenses and adjusted for Project specific costs. In no case shall this documentation period include more than eighteen (18) months prior to the date of award of this Contract.

Lump-sum payments to employees are not allowed under this Contract. Billing rates for employees who perform professional services of a subordinate or of a position classification having a lower classification/pay range shall be accounted and paid for at the lower hourly billing pay rate. The hourly billing rate charge of any employee may be changed by the Professional with a written and Department approved Contract Modification to account for normal personnel pay increases. Hourly billing rates include, but are not limited to: Overhead items such as employee fringe benefits, vacations, sick leave, insurance, taxes, pension funds, retirement plans, meals, lodging, and all Project related travel expenses for Projects <u>less than</u> one-hundred (100) miles in each direction from the Professional's nearest Michigan office, computer costs/operating costs, data entry, and time, telephone, telephone- related services, and all reproduction services (except Contract Bidding Documents/Deliverables).

The hourly billing rate also includes all reproduction costs for design interpretations, study/design clarifications and Bulletins related to design errors or omissions, construction code compliance (precipitating either from design code compliance and plan review, design interpretations, or construction on-site/field inspections), and all similar, or avoidable costs.

All incidental postage, mail, or other shipping or delivery services, acquisition, bad debts, previous business losses, employment fees, depreciation, and operating costs for equipment, including computer design and/or computer drafting systems, and any specialized testing equipment are to be included. The hourly billina rate shall include. without exception, secretarial. computer/typing/word processing, editing, and clerical services utilized in any way for the Project as well as other non-technical and/or employees providing indirect services. The hourly billing rate also includes all profit without regard to its form or distribution.

Items not allowable as part of the Professional's calculated hourly billing rate include but are not limited to: Any costs associated with litigation and settlements for the Professional, other liability suits, out-of-state offices and associated travel, bonuses, profit sharing, premium/overtime costs, public relations, entertainment, business promotion, contributions, and various speculative allowances.

The hourly billing rate for the Professional may not be applied to the work of the Professional's Sub- Consultant's staff. Each Sub-Consultant firm must submit a separate hourly billing rate with proper documentation for Sub-Consultant services provided as part of the Proposal. The hourly billing rate of the respective Consultant firm shall be used for that Consultant firm's personnel only. No mark-up to Consultant firm's charges will be allowed.

2.3 RANGE OF EMPLOYEE HOURLY BILLING RATES: The Professional shall identify the service being provided and include the Professional's or Consultant's employee(s) full names and position classifications for the Project and their current hourly billing rates at the beginning and at the anticipated end of the Project. This hourly billing rate range shall reflect any anticipated pay increases over the life of the Contract. The range of hourly billing rates for any employee position or classification may not be changed without an approved Contract Modification.

2.4 DIRECT COST REIMBURSEMENT ITEMS: The Professional's Consultant services and authorized reimbursable expenses shall be treated as an authorized reimbursable expense item at a direct cost. The Professional shall be responsible for the selection of the supplier of the professional services or materials; the coordination, adequacy, and application of the professional services, whether provided by the Professional's staff or provided by their Consultant, and any Project costs that exceed the budget for each Phase.

Project related travel expenses (mileage, meals, lodging) for Projects **more than** onehundred (100) miles in one- way from the Professional's nearest office shall be treated as an authorized reimbursable expense at the State of Michigan's current travel rates.

Unless authorized elsewhere in this Contract, direct cost reimbursement items shall be limited to the actual cost of printing and reproduction of project deliverables such as Final Study Reports, Surveys, Bidding Documents, and U. S. Mail regular shipping postage of the project deliverables listed above. In addition, direct cost reimbursement items may include soil borings, site surveys and any required laboratory testing, Design Code Compliance and Plan Review Approval Fees by the licensing agency; reproduction of documents for legislative presentation, artistic productions, mobilization of testing equipment, laboratory costs for testing samples, per-linear-foot cost of soil borings and specialized inspections of the structural, mechanical, electrical, chemical or other essential components of the Project.

Compensation for this Contract shall not exceed the budget per Project Phase identified in the attached Contract Order unless authorized by a Department approved Contract Modification. It shall be the Professional's responsibility to carefully monitor Project costs, activities, and progress and to provide the Project Director/Agency Project Manager timely notification of any justifiable need to increase the authorized budget. The Professional may not proceed with professional services that have not been authorized by the Project Director/Agency Project Manager and shall immediately notify the Project Director/Agency Project Manager if such services have been requested or have become necessary.

Professional/Sub-Consultant staff and hourly billable rates are identified in the attached Professional's proposal.

#### ARTICLE III PAYMENTS

Payment for the professional services shall be based on the Professional's performance of authorized professional service(s) performed prior to the date of each submitted payment request. Payment requests shall be submitted monthly to the Project Director/Agency Project Manager on a payment request form (DTMB-440). Payment for each monthly submitted payment request shall be made within thirty (30) consecutive calendar days following the Department's approval of the payment request. Payment requests shall include signed certification by the Professional of the actual percentage of work completed as of the date of invoicing for each Phase and summarize the amounts authorized, earned, previously paid, and currently due for each Project Phase. Payment requests shall be supported by itemized records or documentation in such form and detail as the Department may require.

Each of the Professional's Consultant's submitted payment request applications shall include similar information. This includes, but is not limited to:

- Phase Numbers for the professional services provided.
- Professional's personnel and position/classification providing service and hours worked. Current hourly billing rate charges for each individual position/classification.
- Copy of certified on-site visitation log or site visit report showing time on-site.
- Itemized invoices from each of the Professional's Consultant's documenting that firm's professional services charge and the Project work related services provided.
- Authorized reimbursable expense items provided with receipts and invoices.

The State has the right to withhold payment of any disputed amounts until the parties agree as to the validity of the disputed amount. The State will notify the Professional of any dispute within a reasonable time. Payment by the State will not constitute a waiver of any rights as to the Professional's continuing obligations, including claims for deficiencies or substandard Contract Activities. The Professional's acceptance of final payment by the State constitutes a waiver of all claims by the Professional against the State for payment under this Contract, other than those claims previously filed in writing on a timely basis and still disputed.

The State will only disburse payments under the Contract through Electronic Funds Transfer (EFT). Contractor must register with the State at <u>http://www.michigan.gov/SIGMAVSS</u> to receive electronic funds transfer payments. If Contractor does not register, the State is not liable for failure to provide payment. Without prejudice to any other right or remedy if may have, the State reserves the right to set off at any time any amount then due and owing to it by Contractor against any amount payable by the State to Contractor under this Contract

### ARTICLE IV ACCOUNTING

The Professional shall keep current and accurate records of Project costs and expenses, hourly billing rates, authorized reimbursable expense items, and all other Project related accounting documents to support the Professional's monthly application for payment. Project records shall be kept on a generally recognized accounting basis. Such records shall be available to the Department for a period of ten (10) years after the Department's final payment to the Professional. The State of Michigan reserves the right to conduct, or have conducted, an audit and inspection of these Project records at any time during the Project or following its completion.

### ARTICLE V INSURANCE

The Professional shall purchase, maintain and require such insurance that will provide protection from claims set forth below which may arise out of or result from the Professional firm's services under this Contract, whether such service is performed by the Professional or performed by any of the Professional firm's Consultant's or by anyone directly or indirectly employed by them, or by anyone for whose acts they may be liable. The following insurance policy limits described below are intended to be the minimum coverage acceptable by the State:

For the purpose of this Section, "State" includes its departments, divisions, agencies, offices, commissions, officers, employees, and agents.

- (a) The Contractor must provide proof that it has obtained the minimum levels of insurance coverage indicated or required by law, whichever is greater. The insurance must protect the State from claims that may arise out of or result from or are alleged to arise out of or result from the Contractor's or a Subcontractor's performance, including any person directly or indirectly employed by the Contractor or a Subcontractor, or any person for whose acts the Contractor or a Subcontractor may be liable.
- (b) The Contractor waives all rights against the State for the recovery of damages that are covered by the insurance policies the Contractor is required to maintain under this Section. The Contractor's failure to obtain and maintain the required insurance will not limit this waiver.
- (c) All insurance coverage provided relative to this Contract is primary and noncontributing to any comparable liability insurance (including self-insurance) carried by the State.
- (d) The State, in its sole discretion, may approve the use of a fully-funded selfinsurance program in place of any specified insurance identified in this Section.
- (e) Unless the State approves, any insurer must have an A.M. Best rating of "A" or better and a financial size of VII or better, or if those ratings are not available, a comparable rating from an insurance rating agency approved by the State. All policies of insurance must be issued by companies that have been approved to do business in the State. To view the latest A.M. Best's Key Ratings Guide and the A.M. Best's Company Reports (which include the A.M. Best's Ratings) visit the A.M. Best Company internet web site at <u>http://www.ambest.com</u>.
- (f) Where specific coverage limits are listed in this Section, they represent the minimum acceptable limits. If the Contractor's policy contains higher limits, the State is entitled to coverage to the extent of the higher limits.

- (g) The Contractor must maintain all required insurance coverage throughout the term of this Contract and any extensions. However, in the case of claims-made Commercial General Liability policies, the Contractor must secure tail coverage for at least three (3) years following the termination of this Contract.
- (h) The minimum limits of coverage specified are not intended and may not be construed; to limit any liability or indemnity of the Contractor to any indemnified party or other persons.
- (i) The Contractor is responsible for the payment of all deductibles.
- (j) If the Contractor fails to pay any premium for a required insurance policy, or if any insurer cancels or significantly reduces any required insurance without the State's approval, the State may, after giving the Contractor at least 30 days' notice, pay the premium or procure similar insurance coverage from another company or companies. The State may deduct any part of the cost from any payment due the Contractor or require the Contractor to pay that cost upon demand.
- (k) In the event the State approves the representation of the State by the insurer's attorney, the attorney may be required to be designated as a Special Assistant Attorney General by the Michigan Attorney General.

The Professional firm's Errors and Omissions coverage shall include coverage for claims resulting from acts of forbearance that cause or exacerbate pollution and claims of bodily injury and property damage in the amount of \$1,000,000 minimum coverage per occurrence, \$3,000,000 annual aggregate. This insurance is required of all professional firms who conduct professional environmental services including, but not limited to, any of the following services:

- (i) Remedial System Design.
- (ii) Remediation Management.
- (iii) Feasibility Development and Implementation.
- (iv) Hydrogeological Evaluation.
- (v) Media Testing and Analysis.
- (vi) Subsurface and Geophysical Investigation.
- (vii) Other related activities as determined by the Department.

Required Limits	Additional Requirements						
Commercial General Liability Insurance							
Minimum Limits: \$1,000,000 Each Occurrence Limit \$1,000,000 Personal & Advertising Injury Limit \$2,000,000 General Aggregate Limit \$2,000,000 Products/Completed Operations	Professional must have their policy endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds using endorsement CG 20 10 11 85, or both CG 20 10 12 19 and CG 20 37 12 19.						
Umbrella or Excess	Liability Insurance						
<u>Minimum Limits:</u> \$2,000,000 General Aggregate	Professional must have their policy follow form.						
Automobile Liabi	lity Insurance						
Minimum Limits: \$1,000,000 Per Accident	Professional must have their policy: (1) endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds; and (2) include Hired and Non-Owned Automobile coverage.						
Workers' Compensa	ation Insurance						
Minimum Limits: Coverage according to applicable laws governing work activities.	Waiver of subrogation, except where waiver is prohibited by law.						
Employers Liabil	ity Insurance						
<u>Minimum Limits:</u> \$500,000 Each Accident \$500,000 Each Employee by Disease \$500,000 Aggregate Disease.							
Professional Liability (Er Insurar	rors and Omissions) nce						
Minimum Limits: \$1,000,000 Each Occurrence \$2,000,000 Annual Aggregate <u>Deductible Maximum:</u> \$50,000 Per Loss							

Environmental and Pollution Liability (Errors and Omissions) ***						
Minimum Limits: \$1,000,000 Each Occurrence \$2,000,000 Annual Aggregate	Professional must have their policy: (1) be applicable to the work being performed, including completed operations equal to or exceeding statute of repose; (2) not have exclusions or limitations related to Transportation (upset overturn, spills during loading or unloading, Hazardous Materials Handling, and Non-Owned disposal site liability; and (3) endorsed to add "the State of Michigan, its departments, division, agencies, offices, commissions, officers, employees, and agents" as additional insured.					

Contractual Liability insurance for claims for damages that may arise from the Professional's assumption of liability on behalf of the State under Article VI concerning indemnification for errors, omissions, or negligent acts in the course of the professional service or other provision within this Contract to the extent that such kinds of contractual liability are insurable in connection with and subject to limits of liability not less than for the general liability insurance and the professional liability insurance and set forth in subsections (c) and (d) above.

Except where the State has approved a subcontract with other insurance provisions, the Professional must require any Consultant/Subcontractor to purchase and maintain the insurance coverage required in this Article. Alternatively, the Contractor may include a Consultant/Subcontractor under the Professional's insurance on the coverage required in that Section. The failure of a Consultant/Subcontractor to comply with insurance requirements does not limit the Professional's liability or responsibility.

Certificate of Insurance documents, acceptable to the State, shall be provided and filed with the Department prior to commencement of the Professional's Project services, unless otherwise approved in writing, and not less than 20 days before the insurance expiration date every year thereafter. Facsimile copies of the Certificate of Insurance will not be accepted. Certificate of Insurance documents must be either submitted hard copy or portable document file (.pdf). The Certificate of Insurance documents must specify on the certificate in the oblong rectangle space labeled "Description of Operations/Locations/Vehicles/Exclusions Added By Endorsement/Special Provisions/Special Items" the following items: (1) The ISID Title; (2) The ISID Contract Number; and (3) The State of Michigan must be named as an "Additional Insured on the General Liability and Automobile Insurance Policy." The Certificate of Insurance documents shall contain a provision that the Project insurance coverage afforded under the insurance policies for this Contract will not be modified or canceled without at least thirty (30) consecutive calendar days prior written notice, except for 10 days for non-payment of premium, to the State of Michigan, Department.

This Section is not intended to and is not to be construed in any manner as waiving, restricting, or limiting the liability of either party for any obligations under this Contract (including any provisions hereof requiring Professional to indemnify, defend and hold harmless the State).

The attached, Certificates of Insurance documents required for this Project shall be in force for this Project until the final payment by the State to the Professional is made and shall be written for not less than any limits of liability specified above. The Professional has the responsibility for having their consultant firms comply with these insurance requirements.

# ARTICLE VI

- (a) To the extent permitted by law, the Professional shall indemnify, defend and hold harmless the State from liability, including all claims and losses, and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest, and penalties), accruing or resulting to any person, firm or corporation that may be injured or damaged by the Professional in the performance of this Contract and that are attributable to the negligence or tortious acts of the Professional or any of its Subcontractors/Consultants, or by anyone else for whose acts any of them may be liable.
- (b) Employee Indemnification: In any and all claims against the State of Michigan, its departments, divisions, agencies, boards, sections, commissions, officers, employees and agents, by any employee of the Professional or any of its Subcontractors/Consultants, the indemnification obligation under this Contract shall not be limited in any way by the amount or type of damages, compensation or benefits payable by or for the Professional or any of its Subcontractors/Consultants under worker's disability compensation acts, disability benefit acts or other employee benefit acts. This indemnification clause is intended to be comprehensive. Any overlap in provisions, or the fact that greater specificity is provided as to some categories of risk, is not intended to limit the scope of indemnification under any other provisions.
- (c) Patent/Copyright Infringement Indemnification: To the extent permitted by law, the Professional shall indemnify, defend and hold harmless the State from and against all losses, liabilities, damages (including taxes), and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest, and penalties) incurred in connection with any action or proceeding threatened or brought against the State to the extent that such action or proceeding is based on a claim that any piece of equipment, software, commodity or service supplied by the Professional or its Subcontractors/Consultants, or the operation of such equipment, software, commodity or service, or the use of reproduction of any documentation provided with such equipment, software, commodity or service infringes any United States patent, copyright, trademark or trade secret of any person or entity, which is enforceable under the laws of the United States.

In addition, should the equipment, software, commodity, or services, or its operation, become or in the State's or Professional's opinion be likely to become the subject of a claim of infringement, the Professional shall at the Professional's sole expense (i) procure for the State the right to continue using the equipment, software, commodity or service or, if such option is not reasonably available to the Professional, (ii) replace or modify to the State's satisfaction the same with equipment, software, commodity or service of equivalent function and performance so that it becomes non-infringing, or, if such option is not reasonably available to Professional, (iii) accept its return by the State with appropriate credits to the State against the Professional's charges and reimburse the State for any losses or costs incurred as a consequence of the State ceasing its use and returning it.

Notwithstanding the foregoing, the Professional shall have no obligation to indemnify or defend the State for, or to pay any costs, damages or attorneys' fees related to, any claim based upon (i) equipment developed based on written specifications of the State; or (ii) use of the equipment in a configuration other than implemented or approved in writing by the Professional, including, but not limited to, any modification of the equipment by the State; or (iii) the combination, operation, or use of the equipment with equipment or software not supplied by the Professional under this Contract.

### ARTICLE VII OWNERSHIP OF DOCUMENTS

All Project deliverables, including but not limited to: reports, Bidding Documents, Contract Documents, electronic documents and data, and other Project related documents, including the copyrights, prepared and furnished by the Professional shall become the property of the State of Michigan upon completion of the Project, completion and acceptance of the professional's work, or upon termination of the Contract. Project deliverables shall be delivered to the Department upon their request. The Professional shall shall have no claim for further employment or additional compensation as a result of this Contract requirement. The Professional may retain a copy of all Project documents for their files.

If the Professional is in default or breach of its obligations under this Contract, the State shall have full ownership rights of the Project deliverables, including Bidding Documents and Contract Documents, including all electronic data. If the Professional is in default or this Contract Agreement is terminated, the State shall not use the Contract Documents and deliverables of this Contract for completion of the Project by others without the involvement of other qualified Professionals who shall assume the professional obligations and liability for the Project work not completed by the Professional.

To the fullest extent allowed by law, the State releases the Professional, the Professionals Consultant(s) and the agents and employees of any of them from and against legal claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of the State's use of the Contract Documents other than in accordance with this Contract Agreement.

All Contract deliverables listed may be published or issued for informational purposes without additional compensation to the Professional. The Professional may not use any of the Contract Documents and Contract deliverables for any purpose that may misrepresent the professional services they provided.

The Professional shall retain full rights to the Contract Documents and deliverables and the right to reuse component information contained in them in the normal course of the Professional's professional activities.

The Contract deliverables, Contract Documents, or other documents produced under this Contract may be used by the Department, or others employed by the Department or State of Michigan, for reference in any completion, correction, remodeling, renovation, reconstruction, alteration, modification of or addition to the Project, without monetary compensation to the Professional.

The State of Michigan will not construct additional Projects or buildings based on the work of this Contract without notice to the Professional. Whenever renderings, photographs of renderings, photographs or models, or photographs of the Project are released by the State of Michigan for publicity, proper credit for design shall be given to the Professional, provided the giving of such credit is without cost to the State of Michigan.

### ARTICLE VIII TERMINATION

The State may, by written notice to the Professional, terminate this Contract and/or any Assignments, in whole or in part at any time, either for the State's convenience or because of the failure of the Professional to fulfill their Contract obligations. Upon receipt of such notice, the Professional shall:

- a) Immediately discontinue all professional services affected (unless the notice directs otherwise), and
- b) Deliver to the State all data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by the Professional in performing this Contract, whether completed or in process.
- 8.1 If the termination is for the convenience of the State, an equitable adjustment in the Contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed professional services.
- 8.2 If the termination is due to the failure of the Professional to fulfill their Contract obligations, the State may take over the work and prosecute the same to completion by Contract or otherwise. In such case, the Professional shall be liable to the State for any additional cost occasioned to the State thereby.

- 8.3 If, after notice of termination for failure to fulfill Contract obligations, it is determined that the Professional had not so failed, the termination shall be deemed to have been affected for the convenience of the State. In such event, adjustment in the Contract price shall be made as provided in Section 8.1 of this article.
- 8.4 The rights and remedies of the State provided in this article are in addition to any other rights and remedies provided by law or under this Contract.

### ARTICLE IX SUCCESSORS AND ASSIGNS

This Contract shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns; provided, however, that neither of the parties hereto shall assign this Contract without the prior written consent of the other.

### ARTICLE X GOVERNING LAWS

This Contract shall be construed in accordance with the current laws of the State of Michigan. Some Assignments to this Contract will be funded wholly or in part by the Federal Government through grant agreements and/or federal programs. The Professional must comply with such funding requirements along with any current applicable federal regulations in performing the tasks described in the Scope of Work, including but not limited to the following current federal regulations. The absence of reference to any law or regulation does not preclude its applicability to this Contract.

- 1. The Comprehensive Environmental Response Compensation and Liability Act of 1980 as amended CERCLA (The Superfund Act);
- 2. Section 306 of the Clean Air Act (42 U.S.C. 1857 (h));
- 3. Section 508 of the Clean Water Act (33 U.S.C. 1368);
- 4. Public Law 98-473 as implemented in the Department of the Interior, Bureau of Indian Affairs;
- 5. Executive Order 11738; Office of Management and Budget Circular A-87, "Cost Principles for State, Local, and Indian Tribal Governments."
- 6. 25 CFR Part 20; Financial Assistance and Social Services Programs
- 7. 40 CFR Part 31; Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments
- 8. 40 CFR Part 32 Subpart F; Drug-Free Workplace
- 9. 40 CFR Part 33; Participation by Disadvantaged Business Enterprises in United States Environmental Protection Agency Programs
- 10. 40 CFR Part 35; State and Local Assistance

- 11. 40 CFR Part 35 Subpart 0; Cooperative Agreements and Superfund State Contracts for Superfund Response Actions
- 12. 48 CFR Chapter 1 Part 31 Subpart 31.2; Contracts with Commercial Organizations.

### ARTICLE XI NONDISCRIMINATION

In connection with the performance of the Project under this, the Professional agrees as follows:

a) The Professional will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, age, sex *(as defined in Executive Directive 2019-09)*, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position. The Professional will provide equal employment opportunities to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, religion, national origin, age, sex, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position.

Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

- b) The Professional will, in all solicitations or advertisements for employees placed by or on behalf of the Professional, state that all qualified applicants will receive equal employment opportunity consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position.
- c) The Professional or their collective bargaining representative will send to each labor union or representative of workers with which is held a collective bargaining agreement or other Contract or understanding, a notice advising the said labor union or workers' representative of the Professional's nondiscrimination commitments under this article.
- d) The Professional will comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended, MCL 37.2201 et seq; the Michigan Persons with Disabilities Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et seq; *Executive Directive 2019-09*; and all published rules, regulations, directives and orders of the Michigan Civil Rights Commission which may be in effect on or before the date of award of this Contract.
- e) The Professional will furnish and file nondiscrimination compliance reports within such time and upon such forms as provided by the Michigan Civil Rights

Commission; said forms may also elicit information as to the practices, policies, program, and employment statistics of the Professional and of each of their Consultant firms. The Professional will permit access to all books, records, and accounts by the Michigan Civil Rights Commission, and/or its agent, for purposes of investigation to ascertain nondiscrimination compliance with this Contract and with rules, regulations, and orders of the Michigan Civil Rights Commission relevant to Article 6, 1976 PA 453, as amended.

f) In the event that the Michigan Civil Rights Commission finds, after a hearing held pursuant to its rules, that the Professional has not complied with the contractual nondiscrimination obligations under this Contract, the Michigan Civil Rights Commission may, as part of its order based upon such findings, certify said findings to the State Administrative Board of the State of Michigan, which the State Administrative Board may order the cancellation of the Contract found to have been violated, and/or declare the Professional ineligible for future Contracts with the State and its political and civil subdivisions, departments, and officers, and including the governing boards of institutions of higher education, until the Professional complies with said order of the Michigan Civil Rights Commission.

Notice of said declaration of future ineligibility may be given to any or all of the persons with whom the Professional is declared ineligible to Contract as a contracting party in future Contracts. In any case before the Michigan Civil Rights Commission in which cancellation of an existing Contract is a possibility, the State shall be notified of such possible remedy and shall be given the option by the Michigan Civil Rights Commission to participate in such proceedings.

- g) The Professional shall also comply with the nondiscrimination provisions of 1976 PA 220, as amended, concerning the civil rights of persons with physical or mental disabilities.
- h) The Professional will include, or incorporate by reference, the nondiscrimination provisions of the foregoing paragraphs a) through g) in every subcontract or Contract Order unless exempted by the rules, regulations or orders of the Michigan Civil Rights Commission, and will provide in every subcontract or Contract Order that said nondiscrimination provisions will be binding upon each of the Professional's Consultant's or seller.

#### ARTICLE XII CONTRACT CLAIMS AND DISPUTES

In any claim or dispute by the Professional which cannot be resolved by negotiation, the Professional shall submit the claim or dispute for an administrative decision by the Department of Technology, Management and Budget, Director of State Facilities Administration within thirty (30) consecutive calendar days of the end of the disputed negotiations, and any decision of the Director of State Facilities Administration may be appealed to the Michigan Court of Claims within one (1) year of the issuance of the Director's decision.

The Professional agrees that the Department's appeal procedure to the Director of State Facilities Administration is a prerequisite to filing a suit in the Michigan Court of Claims.

### ARTICLE XIII DEFINITION OF TERMS

The definition of terms and conditions of this Contract are described and outlined in the following Articles I through XIV and attached appendices. The capitalized defined terms used in this Professional Services Contract shall have the following definitions:

ADDENDA: Written or graphic numbered documents issued by the Department and/or the Professional prior to the execution of the Construction Contract which modify or interpret the Project Bidding Documents, including drawings, and specifications, by additions, deletions, clarifications or corrections. The Addenda shall: (1) Be identified specifically with a standardized format; (2) Be sequentially numbered; (3) Include the name of the Project; (4) Specify the Project Index No., Project File No., the Contract Order No. Y, and a description of the proposed Addenda; and (5) Specify the date of Addenda issuance. As such, the Addenda are intended to become part of the Project Contract Documents when the Construction Contract is executed by the Professional's recommended lowest responsive, responsible qualified Construction Contractor.

An Addendum issued after the competitive construction Bid opening to those construction Bidders who actually submitted a Bid, for the purpose of rebidding the Project work without re-advertising, is referred to as a post-Bid Addendum.

AGENCY PROJECT MANAGER: The assigned staff of the Department or the State/client Agency authorized by the State to represent and act on behalf of the Project Director on a given Project and to thereby provide direction and assistance to the Construction Contractor. The Agency Project Manager may designate in writing a person to act on behalf of the Agency Project Manager when they are unable to perform their required duties or is away from the office. In such cases, the Agency Project Manager must notify the Construction Contractor and the Project Director.

AGENCY FIELD INSPECTOR: An employee of the State of Michigan under the direction of the State/client Agency who provides the on-site, Inspection of construction Projects for compliance with the study/design intent of the Professional firm's Contract Documents/drawings and specification requirements and the building construction codes. The Agency Field Inspector is the liaison between the Construction Contractor, the Professional, and the Agency Project Manager. The Agency Project Manager, or their Agency Field Inspector, has the authority to require the Professional to respond to and resolve study/design related problems, construction on-site field problems and to attend Project related meetings.

BID: A written offer by a construction Bidder for the Department. Project construction work, as specified, which designates the construction Bidder's base Bid and Bid price for all alternates.

BIDDER: The person acting directly, or through an authorized representative, who submits a competitive construction Bid directly to the Department.

BIDDING DOCUMENTS: The Professional's Project Contract Documents as advertised, and all Addenda issued before the construction Bid opening, and after the construction Bid opening, if the Project construction work is rebid without re-advertising. Bidding Documents shall consist of the Phase 500 - Final Design drawings and specifications, any Addenda issued, special, general, and supplemental conditions of the Construction Contract, and modifications, if any, to standard forms provided by the Department. Such forms consist of the Project advertisement, the instructions to Bidders, the proposal forms, general, supplemental, and any special conditions of the Construction Contract, and the form of agreement between the Department and the Construction Contract for the Project work requirements.

BID SECURITY: The monetary security serving as guarantee that the Bidder will execute the offered Construction Contract or as liquidated damages in the event of failure or refusal to execute the Construction Contract.

BUDGET: The maximum legislatively authorized Budget amount to be provided by the State of Michigan and available for a specific purpose or combination of purposes to accomplish the Project for this Contract.

BULLETIN: A standard document form (DTMB-0485, Bulletin Authorization No. and the DTMB-0489, Instructions to Construction Contractors for Preparation of Bulletin Cost Quotations for Contract Change Orders) used by the Department to describe a sequentially numbered change in the Project under consideration by the Department and the Professional and to request the Construction Contractor to submit a proposal for the corresponding adjustment in the Contract price and/or Contract time, if any. These standard document forms are a part of the "DTMB-0460, Project Procedures" documents package.

CONSTRUCTION CONTRACT: A separate written Contract agreement between the Construction Contractor and the Department for the construction, alteration, demolition, repair, or rebuilding of a State/Client Agency building or other State property.

CONSTRUCTION CONTRACTOR: Any construction firm under a separate Contract to the Department for construction services.

CONSTRUCTION INSPECTION SERVICES: The Professional's field Inspections of the Project during the construction Phase of this Contract which includes but is not limited to: (1) Documenting the quantity and quality of all Project construction work and verifying that the Project construction work is properly completed; (2) Resolve Project problems that are affecting the Project construction work, certify payment requests, process Bulletins, Contract Change Order recommendations, and requests for information (RFI's) in a timely manner as prescribed in the Department's, "MICHSPEC 2001 Edition of The Owner and Contractor Standard Construction Contract and General Conditions for Construction (Long Form)" or the current Department, DTMB Short Form 401 - Proposal and Contract/Front-End Package for Small Projects for Professional Services Contractors (PSC) with General Conditions for Construction and Instructions to Bidders" as adopted and modified by the State of Michigan and incorporated into the Construction Contract; and the (3) Inspection of Project construction work completed or in progress by the Construction Contractor to determine and verify to the Department's Project

Director/Agency Project Manager and their Department Field Representative that the Project construction work is in compliance with the Professional's design intent and that the Project has been completed by the Construction Contractor in accordance with the Professional's Phase 500 - Contract Documents/drawings and specifications requirements.

The Professional shall provide sufficient Inspections of the Project during the construction Phase to administer the construction Phase field and office services as directly related to the degree of Project complexity, up to and including full-time field Inspections. Construction field Inspections shall occur as the construction field conditions and the Project may require and during the regularly scheduled monthly progress and payment meetings.

The Professional shall use for their construction field Inspection services, only personnel having professional expertise, experience, authority, and compatibility with departmental procedures as the Department may approve. The Professional agrees that such characteristics are essential for the successful completion of the Project. Such individuals shall be replaced for cause where the Department determines and notifies the Professional, in writing, of their unacceptable performance.

CONSULTANT: Any individual, firm, or employee thereof, not a part of the Professional's staff, but employed by the Professional and whose professional service cost is ultimately paid by the State of Michigan, either as a direct cost or authorized reimbursement. This includes the recipient(s) of Contract Orders for material, support, and/or technical services. Also, included are persons and firms whose management and/or direction of services are assigned to the Prime Professional as may be provided elsewhere in this Contract.

CONTRACT CHANGE ORDER: A standard document form (DTMB-0403) issued and signed by the State of Michigan and signed by the Professional which amends the Project Design Professional's Contract Documents for changes in the Project/Program Statement or an adjustment in Contract price and/or Contract time, or both.

CONTRACT DOCUMENTS: The Professional's Phase 100 – Study, Final Report and Phase 500 - Final Design plans/drawings, specifications, Construction Contract, instructions to construction Bidders, proposal, Bidding Documents, agreement, conditions of the Contract, payment bond, performance/labor and material bond, prevailing wages, all Addenda, and attachments as may be necessary to comprise a Construction Contract for the Project. Specifications for this Contract will be prepared for Division 00 through 49, in the current version MasterFormat Outline by the Construction Specifications Institute (C.S.I.), as appropriate for the Project.

CONTRACT MODIFICATION: A form (DTMB-0410) amending the Contract signed by the Department and the Professional. The preparation of Bulletins and Contract Change Orders resulting from changes in the Project/Program Statement or previously unknown on-site field conditions as approved by the Department will be compensated to the Professional by way of the Contract Modification in accordance with the Article II, Compensation text of this Contract. Any Contract Modification of this Professional Services Contract must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the Department may require. No Contract Modification will be approved to compensate the Professional for correcting, or for responding to claims or litigation for, the Professional's Phase 100 – Study, Final Report and Phase 500 - Contract Documents study/design errors, omissions or neglect on the part of the Professional.

CONTRACT ORDER: A form (DTMB-0402) issued and signed by the State of Michigan authorizing a Professional to: (1) Begin to incur Project expenses and proceed with the Project on-site; and (2) Provide professional services for the fee amount designated in the Phases of the Contract Order. Issuance of the DTMB-0402 certifies that: (1) The State will enter into a Professional Services Contract for the professional services described in the various Phases of this Contract; and that (2) The proper three (3) sets of Certificate of Insurance documents have been received and accepted by the State along with the approval and signing of the Professional's Professional Services Contract by the SFA, DCD Director.

DEPARTMENT: The Department of Technology, Management and Budget, Facilities and Business Administration, Design and Construction Division. The Department will represent the State of Michigan in all matters pertaining to this Project. This Professional Services Contract will be administered through the Department on behalf of the State of Michigan and The State/Client Agency.

DESIGN MANUAL: Provides the Professional with information regarding the Department's current "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" review process requirements regarding the uniformity in Contract materials presented to it by the Professional and the State/Client Agency(ies). This manual contains the following noted standards, instructions, and procedures information for: (1) General instructions for planning documents from Phase 100-Study through Phase 500-Final Design; (2) Net and gross area/volume; (3) Project cost format; (4) Outline architectural and engineering specifications; (5) Specifications in documentation Phase; (6) Instructions for proposal; (7) Bidders questionnaire; and the (8) Project job sign.

DIRECTOR: The Director of the Department of Technology, Management and Budget or their authorized State of Michigan representative.

DIRECTOR-SFA: The Director of the Department of Technology, Management and Budget, State Facilities Administration or their authorized State of Michigan representative.

DEPARTMENT FIELD REPRESENTATIVE: An employee of the State under the direction of the Department who provides the Inspection of construction Projects for compliance with the design intent of the Professional's Phase 500 - Contract Documents/ architectural and/or engineering drawings and specification requirements and the building construction codes. The Department Field Representative is the liaison between the Construction Contractor, the Professional, and the Project Director/Agency Project Manager. The Project Director/Agency Project Manager, or their Department Field Representative, has the authority to require the Professional to respond to and resolve study/design related problems, construction field problems and to attend Project
meetings. Unless delegated by specific written notice from the Department, the Department Field Representative has no authority to order any changes in the Project scope of work or authorize any adjustments in Contract price or Contract time.

INSPECTION: The Professional and their Consultant firm's on-site and/or off-site examination of the Project construction work completed or in progress by the Construction Contractor to determine and verify to the Department's, Project Director/Agency Project Manager and their Department Field Representative that the quantity and quality of all Project construction work is in accordance with the design intent of the Professional's Phase 500 - Contract Documents/ drawings and specifications requirements.

KEY PRINCIPAL PERSONNEL/EMPLOYEE: An individual employee of a Professional who is essential for the successful completion of the Project.

NOTICE OF INTENT TO AWARD: A written notice to the Construction Contractor, by the Department accepting the Professional's written recommendation to award the construction Bid to the lowest responsive, responsible qualified construction Bidder. The Notice of Intent to Award letter will also designate the Contract price and itemize the alternates that the Department, at its sole discretion has accepted.

PHASE: A discretely distinguishable step necessary to produce the Project in the course of the Professional providing study, design and construction administration services.

PRIME PROFESSIONAL SERVICES CONTRACTOR/PROFESSIONAL: An individual, firm, partnership, corporation, association, or other legal entity who is legally permitted by law to sign and seal final design construction Contract Documents and licensed under the State of Michigan's professional licensing and regulation provisions of the Occupational Code (State Licensing Law), Act 299 of the Public Acts of 1980, Article 20, as amended, to practice architecture, engineering, environmental engineering, geology, civil, land surveying, or landscape architecture services in the State of Michigan.

The Prime Professional Services Contractor/Professional is also legally permitted by the State of Michigan's regulation provisions of the State Construction Code, Act 230 of the Public Acts of 1972, as amended, and designated in a Construction Contract by the Department to recommend construction progress payments to the Construction Contractor.

PROJECT: Any new construction, existing site, new utilities, existing building renovation, roof repairs and/or removal and replacement, additions, alteration, repair, installation, construction quality control and material testing services, painting, decorating, demolition, conditioning, reconditioning or improvement of public buildings, works, bridges, highways or roads authorized by the Department that requires professional study/design services as part of this Contract.

PROJECT COST: The total Project cost including, but not limited to, site purchase, site survey and investigation, hazardous material abatement, construction, site development, new utilities, telecommunications (voice and data), professional fees, construction quality control and material testing services, testing and balancing services, furnishings, equipment, plan(s)/drawing(s) design code compliance and plan review approval fees and all other costs associated with the Project.

PROJECT DIRECTOR: The professional licensed employee of the Department who is responsible for directing and supervising the Professional's services during the life of this Contract. The Project Director, or their Department Field Representative, has the authority to require the Professional to respond to and resolve study/design related problems, construction field problems and to attend Project related meetings.

PROJECT/PROGRAM STATEMENT: The Project/Program Statement is provided by the Department and defines the scope of the problem, describes why this Project is desirable, and provides a preferred resolution of the problem.

PROJECT TEAM: The Professional, the Project Director/Agency Project Manager, Department Field Representative, a representative of the State/Client Agency, and others as considered appropriate by the Department.

PUNCH LIST: A list of minor construction Project items to be completed or corrected by the Construction Contractor, any one of which do not materially impair the use of the Project work, or the portion of the Project work inspected, for its intended purpose. A Punch List shall be prepared by the Professional upon having made a determination that the Project work, or a portion of the Project construction work inspected, in concert with the Professional, the Construction Contractor, the Department, the Project Director/Agency Project Manager and their Department Field Representative, and any construction manager, is substantially complete and shall be attached to the respective DTMB-0455, Certificate of Substantial Completion form. This standard document form is a part of the "DTMB-0460, Project Procedures" documents package.

SOIL EROSION AND SEDIMENTATION CONTROL: The planning, design and installation of appropriate Best Management Practices (as defined by the most current version of the Department's Soil Erosion and Sedimentation Control Guidebook) designed and engineered specifically to reduce or eliminate the off-site migration of soils via water runoff, wind, vehicle tracking, etc. and comply with the Soil Erosion and Sedimentation Control in the State of Michigan as regulated under the 1994 Public Act 451, as amended – The Natural Resources Environmental Protection Act, Part 91 – Soil Erosion and Sedimentation Control. Soil Erosion and Sedimentation Control associated with this Contract will be monitored and enforced by the Department of Technology, Management and Budget, State Facilities Administration, Soil Erosion and Sedimentation Control Program.

STATE: The State of Michigan in its governmental capacity, including its departments, agencies, boards, commissions, officers, employees, and agents. Non-capitalized references to a state refer to a state other than the State of Michigan.

STATE/CLIENT AGENCY: A Department of the State of Michigan, for whose use the Project will ultimately serve, which requires professional design services.

SUBSTANTIAL COMPLETION: The form (DTMB-0445) stating that the Project work, or a portion of the Project work eligible for separate Substantial Completion, has been completed in accordance with the design intent of the Professional's Contract Documents to the extent that the Department and the State/Client Agency can use or occupy the entire Project work, or the designated portion of the Project work, for the use intended without any outstanding, concurrent work at the Project work site, except as may be required to complete or correct the Project work Punch List items.

SUSTAINABLE DESIGN: The Professional's use of a balance of appropriate materials, products and design methods that reduce the impact to the natural ecosystems and be within the Budget constraints of the Project. Sustainable Design shall be used wherever possible by the Professional in their Project design and an itemized list shall be provided with the Professional's Contract Documents that identifies the processes and products.

TASK: Shall mean the following: (1) A quantifiable component of design related professional study/design Task services required to achieve a Phase of the Project; (2) The most manageable sub-element within a study/design Phase; (3) A unique item of work within a study/design Phase for which primary responsibility can be assigned; and (4) Has a time related duration and a cost that can be estimated within a study, design, and construction Phase.

#### ARTICLE XIV COMPLETE AGREEMENT / MODIFICATION

This Professional Services Contract constitutes the entire agreement as to the Project between the parties. Any Contract Modification of this Contract and the Project/Program Statement scope of work requirements must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the State may require. No Contract Modification may be entered into to compensate the Professional for correcting, or for responding to claims or litigation for the Professional firm's final design Contract Documents/study/design errors, omissions or neglect on the part of the Professional.

## PROJECT/PROGRAM STATEMENT

## PROFESSIONAL'S PROPOSAL

## **PROFESSIONAL CERTIFICATION FORMS**

#### OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

CERTIFICATES OF INSURANCE



DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET State Facilities Administration Design and Construction Division

## REQUEST FOR PROPOSAL ADDENDUM NO. 01

This form identifies an Addendum to a Request for Proposal for Professional Services, and incorporates interpretations or clarifications, modifications, and other information into the Request for Proposals. Addenda will be numbered by the Project Director and distributed through SIGMA Vendor VSS as an attachment.

DATE ISSUED
December 7, 2022
FILE NUMBER
N/A
PROPOSAL DUE DATE:
Thursday, January 12, 2023

ADDENDUM ITEMS: (attach additional sheets and drawings if required)

This addendum is to clarify the date for questions.

Questions are to be emailed to Indumathy Jayamani at jaymanii1@michigan.gov, no later 2:00 p.m., EASTERN than on Friday, December 16, 2022

#### APPROVED BY:

PROJECT DIRECTOR Indumathy Jayamani

DATE December 6, 2022

#### STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET State Facilities Administration 3111 W. St. Joseph Street Lansing, Michigan 48917 ADDENDUM NO. 2

#### To: All applicants and interested parties

Date: December 21, 2022

#### Subject: **Department of Technology, Management and Budget (DTMB)** 2023 Environmental Remediation ISID RFP Professional Environmental Consulting Services Various Locations, Michigan Request for Proposal

#### Please acknowledge receipt of this Addendum in your proposal.

#### **Questions and Answers:**

The following questions have been compiled to clarify answers to questions regarding portions of the RFP package:

Q1. Please confirm only one sample 1-week period of field activity logs and a sample weekly report must be provided with the proposal and not under each scope area.

A1. Confirmed.

Q2. Based on the RFP text that Section II-4 is "not required at this time." Please confirm DTMB is not expecting the consultant to provide an outline or any response to this requirement in the proposal at this time and it will only be "required at the time of future assignments"?

A2. Confirmed.

Q3. Please confirm which format is required for a proposal response: A) Only one questionnaire is required for the entire submission with the appropriate scope categories checked, regions checked, and applicable references/personnel for each desired scope; or B) A questionnaire is required for each scope category checked with applicable references/personnel for that desired scope (understanding there likely will be repetition across multiple questionnaires from a single company)?

A3. Only one questionnaire is required for the submission.

Q4. Please confirm whether or not a standalone document addressing Sections II-1 through II-6 of the RFP is required with the Questionnaire as part of this document (II-5) OR can just the Qualifications Questionnaire be submitted as the primary headings of Sections II-1 through II-6 are addressed within the Questionnaire?

A4. Yes, a written narrative addressing Section II-1 through Section II-6 (Section II-4 is for reference only, see A2), must accompany the questionnaire.

Q5. The RFP asks the respondent to provide "...at least three (3) projects in the last five years closely related to each of the project types". Is it acceptable for the respondent to provide a project example(s) that was completed while under the employ of another company?

A5. No, the project's provided as example should have been completed by the company responding to the RFP.

Q6. The Questionnaire and Proposal Format Part I – Technical, appear redundant. The RFP includes, "NOTE: Any information provided in one location can be referenced as needed in other locations." Please confirm that statements such as, "Refer to Questionnaire Response 5.1." or "Refer to Proposal Response II-4." is sufficient if a response is provided in one of the two documents. Or is the format intentionally redundant and EGLE requires a response in both locations, with a more expansive response provided in the proposal response narrative?

A6. For any information that is already provided in the questionnaire, referring that information is sufficient.

Q7. The billing rate document example provided as II-2-A. Position, Classification and Employee Billing Rate Information is similar, but differs from the MS Word document 2023 Environmental Fillable Position Class Billing Rate Worksheet (rev 221205). Please confirm the MS Word document is the format to include in the submittal.

A7. Confirmed.

Q8. Will EGLE include a list of sites and project types that will be included in the ISID contract in Year 1?

A8. No.

Q9. Is there a limit or targeted number of vendors the Department/Advisory Committee will offer a contract?

A9. No.

Q10. May respondents modify the 2023 Environmental Questionnaire to include additional project reference information (i.e., Project 4 Reference Information, Project 5 Reference Information)?

A10. Yes.

Q11. Page 9 of the proposal states, "The following items B, C, and D will be required only at the time a proposal for an individual assigned project is requested."; however, the statement is followed by bulleted items A, B, C. Please clarify.

A11. Typo noted. The Bullets should have been named B, C, and D.

Q12. Section I-9 of the RFP ("Proposals") states "when uploading, your attachment(s) the attachment must be 6mb or less." Can a bidder's proposal consist of more than one attachment, each being less then 6mb?

A12. Yes.

Q13. RFP, Section II, Part 1 Technical; Section II-3 Personnel. Please provide further detail regarding what is meant by chronological.

A13. Resumes of all proposed Key Personnel should include the period the experience occurred.

Q14. RFP, Section II, Part 1 Technical; II-5 Questionnaire? Please clarify what is meant by "narrative addressing the items above".

A14. See A4.

Q15. Questionnaire, Article 1, subsections 3, requests an organization chart depicting key personnel and their roles for a typical assigned project. The projects under this contract are anticipated to include a wide range of scopes and required skill sets. Please provide additional detail on what constitutes a typical assigned project for use in developing the requested organizational chart.

A15. The organizational chart should note the Key Personnel and staff needed for the project types and services identified in the questionnaire.

Q16. Questionnaire, Article 1, subsections 5, states "provide a four-year rate schedule per position". What is being asked for here? Is this different from II-2-A Position, Classification and Employee Billing Rate Information?

A16. The same information is being requested in both places.

Q17. Page 6 of the RFP states "when entering the proposal amount, please enter the total cost amount as \$1.00", but the Project Statement states, "please enter the total cost for all phases as the bid amount." Which method is preferred?

A17. Discrepancy noted. Please enter the bid amount as "\$1.00" as stated in the RFP.

Q18. In section II-2 of the RFP (page 6) states that the bidder should "Indicate which of these individuals you consider to be "Key Personnel" for the successful completion of these project types, identify them by position and classification and provide their resumes." Should resumes only be included for individuals that meet the "Professional Key Personnel" criteria in the "Guidelines for Position Classifications" or can we include resumes for personnel we consider key, but may be considered non-key in the position classification criteria?

A18. Yes.

Q19. Section II of the RFP (proposal format) states that the proposal must be submitted in the format outlined. However, in subsection II-4 "Management Summary, Work Plan, and Schedule," it is noted that this section is for reference only. May we omit this section heading from our proposal?

A19. See A2.

Q20. Question 4 in Article 1 of the questionnaire asks about recent changes in organizational structure (e.g., management team) or control of your company. Please define recent.

A20. Any changes within the past 12 months.

Q21. Several of the questionnaire questions, especially in Article 5, appear to request a singular number answer (as a percentage or number of days/weeks). We believe it may be helpful to provide more context for several of these questions. Will that type of response be accepted, or shall we limit our response to the singular, numerical answer only?

A21. At a minimum the percentage is required.

Q22. Article 6 of the questionnaire includes 5 Key Personnel. Should these include only the "Level 4" key personnel as described in the Guidelines for Position Classification or all Level 3 and Level 4 Key Personnel. If the latter, may we add an attachment for additional Key Personnel beyond the 5 spaces included in the questionnaire?

A22. See A18. Additional spaces can be added as needed.

Q23. In Article 6 of the questionnaire, questions 6.3 and 6.4 refer to the Professional Project Manager. Can you define "Professional Project Manager." Can this be more than one person?

A23. Please refer to the Guidelines for Position Classifications. Yes, Project Manager, can be more than one person.

Q24. The RFP asks in II-2 for an "Outline your experience with similar projects, sites, and clients as examples." The ask for similar project descriptions is repeated in II-6 and in Article 8 of the questionnaire. Is there a preference for which section includes the project examples?

A24. Responses are required for both parts. Also, see A6.

Q25. Page 6 of the Scope of Work document indicates that the Professional shall arrange for all its employees that will be working on a contaminated site to attend a health and safety training course, and/or a personnel protection course. Can you specifically identify which safety training courses are required?

A25. The professional, needs to identify all training required by State and Federal laws for personal working on a particular site type, and ensure that their employees working on that project/site have the necessary training.

Q26. RFP Page 8 and 12, Table II-2-A: Do we input employee names on this table? And classification (from "Guidelines for Position Classifications")?

A26. Yes.

Q27. Under Article 8 of the Questionnaire, is it expected we provide three references overall that encompass all the service areas we select or three references per service area.

A27. Please ensure you provide a minimum of three references per service area.

Q28. Please clarify the preference provisions for Michigan-based firms. Preference is not stated in the RFP document, but it is stated in the Scope of Work, and a certification form is attached to the RFP. If there is a preference, how is it applied?

A28. None.

Q29. Are there any preference provisions for Small Business Enterprises or Disadvantaged Business Enterprises?

A29. None.

Q30. The RFP states that "The ISID contracts will supplement, but not replace, standard requests for proposals or qualifications as a method for obtaining professional services." Please clarify how this contract will be used to supplement other methods for obtaining professional services.

A30. ISID contract is a standalone method in addition to the standard request for proposal process.

Q31. The RFP states that "DCD reserves the option of requesting ...proposals from more than one professional for a particular project." Please clarify the conditions, metrics or process for how the DCD decides whether to ask multiple ISID contract-holders to submit proposals for the same project.

A31. This will be decided on a case-by-case basis.

Q32. Are any terms of this (sample) contract negotiable, including, but not limited to, subjects of Indemnification, defend and hold harmless, and limitation of liability?

A32. No.

Q33. The scope of work states "The Professional's personnel and the personnel of its subconsultants/subcontractors will be required, if requested by the Agency Project Manager on behalf of EGLE's attorneys, to provide assistance to the State in the form of participation in legal actions against alleged responsible parties... including the preparation and execution of interrogatories, affidavits, and testimony as a fact witness... "The State will reimburse the Professional for such assistance as described above at the contractually approved rates for the Professional's personnel at the time services are required." May respondents submit classification-based labor rates for litigation support with the schedule of Position, Classification, and Employee Billing Rate Information, to be approved in the contract? And similarly, for Expert Witness Fees?

A33. The hourly billing rates for these types of services can be included.

Q34. Are subcontractors bound to contract rates (provided in the rate sheet)?

A34. No.

Q35. Can a sub (contractor) do lumpsum on the task orders?

A35. Payment of subcontractors is determined between the contractor and subcontractor.

Q36. Experience (questionnaire) – Do project examples need to be Michigan-specific (extra points?) or countrywide?

A36. Can be either.

Q37. Personnel (questionnaire) - Michigan based personnel required or given extra points?

A37. No.

Q38. Do sub-consultants need to complete the Environmental questionnaire?

A38. No.

#### PROFESSIONAL'S PROPOSAL

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Michigan Department of Technology, Management and Budget 2023 Indefinite Scope Indefinite Delivery (ISID) Contract January 12, 2023

WSP Engineering and Consulting of Michigan, Inc. 46850 Magellan Drive, Suite 190 Novi, Michigan 48377 Office: +1 (248) 926-4008





January 12, 2023

**WSP USA Inc.** 46850 Magellan Drive, Suite 190 Novi, Michigan, 48377 +1 (248) 926-4008

www.wsp.com

Indumathy Jaymani Project Director Department of Technology, Management and Budget Facilities and Business Services Administration, Design and Construction Division 3111 W. St. Joseph Street Lansing, MI 48917

Re: 2023 Indefinite Scope Indefinite Delivery (ISID) for Professional Environmental Environmental Services

Dear Ms. Jaymani:

WSP Engineering and Consulting of Michigan, Inc. (WSP) is pleased to submit Part I and Part II Proposals for the above-referenced Request for Proposal through the State of Michigan Procurement System (SIGMA VSS). Further, we acknowledge receipt of Request for Proposal Addendum No 1, dated December 7, 2022; Addendum No 2, dated December 21, 2022.

WSP understands that our success ultimately depends on the State of Michigan's success. We have focused on forging a long-term partnership with the State, built on trust, outstanding project management, performance, and experience. We look forward to continuing this partnership by providing you with distinct advantages that set us apart from other firms. Please contact Garret Bondy at any time at 248/514-1260 or garret.bondy@wsp.com

Sincerely,

WSP Engineering and Consulting of Michigan, Inc.

Garret E. Bondy Vice President; Program Manager

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## 1. General Information and Project Team

WSP Engineering and Consulting of Michigan, Inc. (WSP) is a large, nationwide business that provides environmental consulting, infrastructure engineering, and construction services to public and private clients. WSP has serviced clients in Michigan and throughout the Midwest and has a track record of 39 years of successful project delivery to the State.

WSP offices in Novi and Traverse City, Michigan have a distinguished history of providing high technical quality consulting and engineering solutions to the State of Michigan. Our Michigan based staff is comprised of approximately 95 skilled engineers, scientists, technicians, and administrative personnel.

# NAME AND ADDRESS OF ORGANIZATION:

WSP Engineering and Consulting of Michigan,
Inc. (WSP)
46850 Magellan Drive, Suite 190
Novi, MI 48377
Tel.: (248) 514-1260
Point-of-Contact: Garret Bondy, PE; garret.bondy@wsp.com
SIGMA Number CV005901

#### **BRANCH OFFICES:**

Novi – 46850 Magellan Drive, Suite 190, Novi MI 48377 Traverse City – 41 Hughes Dr, Traverse City, Mi 49684

## **OPERATION STATUS:**

Corporation

## STATE INCORPORATED:

WSP Engineering and Consulting of Michigan, Inc. was incorporated in the State of Delaware on January 6, 1992.

#### LICENSED TO OPERATE IN MICHIGAN:

WSP is licensed in the State of Michigan, effective March 26, 1992

#### Fast Facts

- ✓ WSP has been providing services to the State of Michigan since 1983.
- Proposed Program Manager, Garret Bondy, PE has served in this role for multiple State of Michigan contracts for the past 2 5 years.
- ✓ WSP has:
  - 36 Michigan registered
     Professional Engineers (PEs)
  - WSP is a recognized national leader in emerging contaminants
  - WSP has successfully completed projects for the State of Michigan involving all of the project types and services requested by the State designed and implemented multiple in -situ chemical oxidation (ISCO) and alternative remedies in Michigan

## ADDENDUM NO. 1 AND ADDENDUM NO. 2:

WSP acknowledges Addendum No 1, dated December 7, 2022; Addendum No 2, dated December 21, 2022.

## 2. Understanding of Project and Tasks

WSP understands that the overall project goal is to protect human health and the environment at contaminated sites. We understand that our mission is to assist the State in achieving this goal through various regulatory programs including Michigan's Natural Resource Environmental Protection Act (NREPA), particularly in accordance with Parts 201 and 213, as well as within the requirements of the Federal Superfund program at Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) sites. We further appreciate the need to comply with the requirements of other regulatory programs.

## 2.1 Project Requirements

WSP's Michigan Operation has a vast amount of experience in all aspects of the tasks envisioned under this contract. Below are summaries of our understanding of the services being requested (as listed in Article 2 of the Questionnaire).

#### 2.1.1 Asbestos/Lead/Mold/Biohazard/Free Product/Regulated Waste Survey/Abatement

<u>Asbestos</u>–WSP has completed hundreds of asbestos inspections in accordance with the procedures outlined in the Asbestos Hazard Emergency Response Act (AHERA) regulations, for pre-demolition and OSHA auditing purposes, which includes identifying, quantifying, and sampling suspect asbestos containing materials (ACMs), review of laboratory results, preparation of technical summary reports, formulating proper management and planning procedures for confirmed ACMs such as encapsulation, abatement, and disposal activities.

## WSP Michigan-based staff includes ten certified State of Michigan Asbestos Inspectors and one Asbestos Management Planner.

An asbestos survey usually consists of an asbestos inspection, sampling, analyses, and reporting. Based on the findings of the asbestos survey, the inspector selects sample locations and the number of samples required. Bulk samples for determination of asbestos content by polarized light microscopy analysis, USEPA Method 600/M4-82.020 are collected. All samples are collected in accordance with the procedures outlined in the AHERA regulations, 40 CFR Part 763. The number of samples collected are in accordance with the frequency recommended in AHERA. All samples are analyzed by a National Voluntary Laboratory Accreditation Program certified laboratory. The asbestos report is often provided as an appendix to remedial investigation reports and/or demolition bid specifications.

<u>Lead</u>-WSP has qualified staff to perform visual lead assessments. Our staff has experience identifying and quantifying suspect lead containing materials that are typically present on surfaces such as paint, reflective paint, and glazed brick. Field screening techniques include the use of an XRF unit that emits an infrared beam directed to a suspect solid (e.g., building

surfaces and site soil) and provides a real time reading of the lead concentration present in parts per million (ppm). WSP staff collect bulk samples for use in waste characterization purposes since the laboratory analysis can include total lead and TCLP lead. The assessment includes identifying and quantifying lead containing materials using bulk sampling and/or XRF field screening techniques, review, and comparison of results to applicable criteria, and preparation of a technical report.

*Mold*–WSP has three local experienced staff that can conduct mold/fungal assessments and are backed by mold experts from across the company. They have utilized several bulk sampling and air sampling methods to evaluate indoor spore conditions including spore traps, bio-tape, cultural plate impactor, and portable air samplers. Bulk sampling includes the use of bio-tape on interior surfaces suspected to contain mold. Spore traps and portable air sampling equipment are used to collect outdoor and indoor air samples. The sampling media are submitted to a laboratory for growth and speciation. Since no health-based standards have been established for indoor spore levels, the mold/fungal indoor results are compared to outdoor results for determination of background. Based on this comparison, it is determined how degraded the indoor air quality is versus the outdoor air.

WSP completed 13 mold assessments, 23 asbestos assessments and 2 lead-based paint assessments for Bank of America on properties entering into the foreclosure process. WSP provided cost estimates for resolving mold issues, allowing Bank of America to add value or devalue properties prior to entering into foreclosure procedures. In addition, evaluation and inspection data was used to inform bank personnel and bank contractors entering the buildings of possible harmful exposure.



*Biohazards* – Biohazards may be occasionally encountered as rare contaminants at sites. Biohazards include infectious agents such as what is found in medical waste or blood borne pathogens or may be related to animal wastes such as bird droppings that accumulate in abandoned buildings, or biological agents such as anthrax or nerve agents associated with terrorist activities. Specific personal protective equipment requirements and strategies are developed when assessing any potential biohazards and biohazards are properly contained and disposed.

WSP's Novi Michigan office was contracted by the National Park Service to provide structural rehabilitation for the Good Fellow Lodge at Indiana Dunes National Lakeshore. During the course of the renovation work, bird guano and raccoon remains were discovered in the basement. WSP using the proper PPE removed and disposed of these as a biohazard.



<u>Free Product</u>—When released to the environment, nonaqueousphase liquids (NAPL) can act as a source of contamination for decades. Both light and dense nonaqueous-phase liquids (LNAPL and DNAPL) can migrate vertically and laterally. Individual chemical components can sorb to soil, dissolve in groundwater, and/or vaporize into soil gas with potentially harmful effects via the direct contact, drinking water, and inhalation exposure pathways. For these reasons, EGLE encourages the immediate recovery of NAPL, where practicable. EGLE has provided Michigan-specific technical guidelines for evaluating and implementing LNAPL recovery in "RRD Resource Materials 25-2014-01" (June 2014). WSP also uses technical guidance documents published by several other organizations (e.g., ITRC, ASTM, API, USEPA).

At the pore scale, NAPL recoverability is controlled in large part by its mobility, or its ability to displace the fluids that occupy the adjacent pore space. Factors that influence mobility include soil heterogeneity, pore size, and water saturation as well as NAPL physio-chemical properties such as viscosity, density, and wettability. WSP has used laboratory analyses of soil and NAPL properties to support mobility evaluations. DNAPL migration within the saturated zone is heavily dependent on some of these properties. For example, the vertical migration of coal-related waste, e.g., from manufactured gas plants or coal tar refining (or similar NAPLs with a specific gravity near 1.0) may be limited by its low relative density, and lateral spreading may be more likely, particularly at soil discontinuities. Conversely, chlorinated DNAPLs with low interfacial tension are more likely to migrate vertically and exhibit less lateral spreading than a coal-related waste.

WSP uses pilot testing to assess the long-term NAPL recovery rate, test different recovery methods, establish realistic objectives, and represent baseline conditions for performance monitoring. These tests account for site-specific factors, such as spatial variations in soil and NAPL properties, that can make or break the recovery system's effectiveness. Pilot testing is especially important to confirm DNAPL recoverability estimates before committing to the time and cost required for construction of a full-scale system. Most importantly, our staff have the knowledge and experience to conduct these tests and correctly interpret the results in the presence of potentially confounding factors. Misinterpretation and/or mischaracterization leads to excessive costs and potential system failure.

At the former Zephyr Naph-Sol Refinery Site WSP worked with EGLE to implement an ISCO injection/extraction program to remove NAPL. ISCO injection fluids used mobilize NAPL which was then extracted from downgradient wells using a vacuum truck. Subsequent monitoring resulted in estimates that through this program contaminant mass was reduced by 80-90% compared to baseline groundwater results and 2012 LIF survey results.



In WSP's experience, flexibility and creative problem-solving skills are essential on NAPLrecovery (and most other) projects. At high-transmissivity sites, recovery systems may include multiphase (NAPL, water, and vapor) extraction, skimmer pumps and water table depression. NAPL separation vessels and separation media are used to consolidate waste streams and minimize treatment and disposal costs. WSP has designed, built, and operated aggressive NAPL-recovery systems using in-situ enhancements including surfactant and co-solvent injections that desorb and emulsify the product to enable bulk removal through hydraulic recovery; and thermally enhanced systems that increase mass removal rates by lowering the viscosity of the liquid to increase transmissivity and/or recovering lighter fractions as a vapor.

Simply excavating NAPL-impacted soil is occasionally the most cost-effective solution. Conversely, containment technologies combined with institutional controls may be the answer where cost-effective NAPL removal is not feasible. Diligent monitoring, periodic vacuum truck visits, recovery by hand bailing, and/or deployment of sorbent socks in monitoring wells may be the best choices for a site with low-transmissivity soil where multiple lines of evidence have shown that the volume of NAPL-impacted soil is stable or shrinking.

Regardless of the solution, each NAPL-management project includes a technology evaluation to ensure the right plan is selected. Clear objectives, performance metrics, and a sound conceptual site model (CSM) help determine when to discontinue recovery or to transition from continuous recovery to pulsed operation or monitoring and institutional controls.

For the EGLE Feister Oil site, WSP designed and installed a mobile product extraction system that limited groundwater extraction. Design elements included: Total fluids recovery, followed by ex-situ treatment with LNAPL separation, vapor adsorption using granular activated carbon, and groundwater polishing using organo-clay separation. The system was highly effective and the system was decommissioned and the site remedy was transitioned to monitored natural attenuation.



Regulated Waste Survey (RWS) - Sampling of hazardous materials and containers is completed by WSP staff that have the required OSHA training, (e.g., 49 CFR 1910.120 hazardous materials training). WSP has sampled all types of hazardous materials including unknowns, ignitable, corrosive and reactive wastes in both liquid and solid forms in containers. We also have staff experienced in sampling suspected explosive and radioactive wastes. An RWS can include a visual survey of on-site structures, inventory and characterization of non-hazardous and potentially hazardous waste material and debris, volume estimating, sample collection, and photographic documentation. WSP completes an RWS to identify wastes that require special handling (e.g., light ballasts, mercury switches), or materials that would affect workers health during demolition (e.g., asbestos, lead based paint). WSP completes inspections that focus on collecting the necessary building measurements for take-off quantities to develop bid quantities for demolition of site buildings and other site features. During the inspection, WSP identifies possible areas of environmental concern, and inventories other important site features (e.g., the presence of transformers, potential asbestos, potential lead-based paint, and the presence of pits, sumps, drums) which may require sampling to characterize the demolition debris for disposal. If necessary, sampling of transformers for polychlorinated biphenyls (PCBs) and building materials for asbestos content are conducted. Because of the

potential that a wide range of media may be encountered at some facilities (e.g., sumps, leadbased paint, drums, and soil) the sampling locations are field selected by WSP's Field Operations Leader (FOL). The FOL has the flexibility in selecting sampling locations, parameters, and quantities. WSP presents the results of the site inspection and sampling in a Universal and Hazardous Waste Report. The report provides the approximate sample locations on drawings, and tabulated analytical results.

#### WSP, as part of the Project Team for a confidential utility company, conducted a regulated waste survey (RWS) at three coal-fired power plants in Michigan. These power plants are slated for demolition. The RWS included survey of all site drums, light ballasts, USTs, and mercury switches.

<u>Abatement</u> - WSP's Team has experienced personnel to monitor

and manage various asbestos, mold, and lead abatement projects ranging from building abatement to soil remedial projects regulated by NESHAP, OSHA, and/or DOT. Abatement monitoring would include calibration, operation, and sample preparation for personal air samplers, work site perimeter air samplers, and work area clearance samplers. Abatement management activities include onsite worker safety/training management, proper personal air respirator use/care, properly labeling and placarding staged waste containers, and transporters prior to departure, waste transport and disposal documentation, and correspondence with local, state, and federal regulatory agencies. WSP's-Team has managed various sized abatement related projects ranging from small commercial office buildings to multi-acre industrial plants. WSP has the resources to conduct the preliminary investigation, prepare bid specifications, review bid submittals, and help DTMB procure abatement contractors.

At the Former C&H Power Plant Site in Lake Linden MI, WSP conducted the asbestos, mold, and lead-based paint survey, procured the subcontractor, and oversaw the abatement of over 14,000 tons of asbestos contaminated soil and debris.

#### 2.1.2 Brownfield Development

WSP can perform the full range of environmental activities that are required for brownfield development. We also have the experience to help stakeholders negotiate their way through grant applications, USEPA Brownfield Community-Wide Assessment Grants, Michigan Reclamation Grant, banking requirements, community outreach, and City or State brownfield requirements. WSP has award winning redevelopment expertise and has won national awards for our work.





WSP assisted EGLE with redevelopment of the Broadway Coin Laundry property in Ann Arbor by evaluating the site characteristics for a permeable reactive barrier (PRB) wall to reduce tetrachloroethylene (PCE) in groundwater. When Morningside Equities Group, Inc. (Morningside) purchased the property to redevelop for residential use, WSP provided an engineering evaluation of Morningside's Act 381 Work Plan for brownfield funding, PRB wall, source area reduction remedies, and pilot study. These efforts helped protect human health without inhibiting redevelopment.



*Ecological Risk Assessments*–WSP has a full staff of risk assessors that only conduct ecological risk assessment (ERAs). Collection of the proper ecological and contaminant data is critical to developing a defensible ERA. These include ecological characterizations, threatened/endangered species assessments, media and biota sampling, and biomonitoring. ERAs are conducted on a multi-step basis with a screening level ERA conducted first, followed by a more in-depth assessment, if warranted. Once the proper data is collected, WSP's risk assessors use statistical interpretations of sampling data, quantification of exposures and effects, source to receptor multi-media modeling, development of toxicity values and development of benchmarks for aquatic and terrestrial receptors to evaluate the ecological risk.

At the MDNR Old Rose Lake Shooting Range site, WSP developed and implemented a Baseline Ecological Risk Assessment where lead concentrations in soil, earthworms and small rodents were measured to evaluate exposure risks to individual species and the food chain.



*Forestry & Land Management*—The MDNR manages 4.6 million acres of surface ownership and 6.4 million acres of mineral rights ownership for the State of Michigan. Management of these millions of acres is a very important task under taken by the State and it takes a multidisciplined team to manage. WSP has various professional disciplines to help the State with this important work. Almost all public land, whether it is federal, state, or local, has land management requirements. In some cases, extensive legal requirements; in other cases, there are simply natural resources that require management outside the time or expertise of those charged with their stewardship. WSP understands the importance of managing natural resources and the challenges and complexities associated with their management. WSP offers an experienced group of biologists, ecologists, foresters, and natural resources and National Environmental Policy Act (NEPA) specialists. WSP has worked with a wide variety of clients, including multiple entities within the U.S. Departments of Defense, Interior and Agriculture, as well as numerous states (including Michigan), cities and private clients across the United States. Projects have ranged from resource-specific management plans (e.g., Forest



Management Plans), comprehensive integrated natural resources management plans, comprehensive vegetation surveys, to urban forestry and hazard assessments. WSP also understands the demands of working with multiple stakeholders (internal and external) and the necessity of finding solutions that meet regulatory requirements, stakeholder input and client needs.

Because of Camp Grayling's potential to impact the highly prized and sensitive Au Sable and Manistee River drainage basins, WSP is often called upon to address environmental concerns as part of the land management at the Camp. WSP has conducted extensive chemical and biological studies to evaluate sensitive habitats. In 2018, WSP completed a Watershed Management Plan with specific emphasis on Lake Margrethe that provides a framework to preserve and protect water quality and natural resources within the watershed.



<u>Wetland Mitigation</u>—WSP staff have been involved in numerous mitigation projects for both streams and wetlands ranging from

individual sites to mitigation banks used to offset damages elsewhere. Our multidisciplinary approach makes us particularly successful. Input from hydrogeologists, engineers, botanists, wetland professionals, aquatic biologists and others allows for the proper balance of science and engineering to achieve the desired goals. These services have been performed for commercial businesses, states (including Michigan), not for profit agencies, and commercial mitigation bank corporations. Projects have ranged from simply breaking drainage tiles in a field to the excavation of hundreds or thousands of cubic yards of soil to reduce flooding, improve water quality, and create wetlands. We pride ourselves with maximizing the size and quality of the wetlands while minimizing costs. Our staff are trained and experienced with native plant species found in the state, the materials that are available from local nurseries, problems with nuisance species such as geese and beaver, and issues associated with invasive species.

On Wolf Creek in Edmore, Michigan, WSP first conducted a wetland delineation and determined the nature and extent of heavy metals and PCBs in the sediments. WSP restored wetlands by removing the contaminated soils then restoring the wetland by adding organic soils and planting native plants.



<u>Streams & Lakes Restoration</u> - WSP has been providing ecosystem restoration services for over 25 years, allowing us to design innovative, reliable and sustainable natural systems. WSP has an experienced team of engineers, biologists, geologists, chemists and other multidisciplinary members that contribute to a design. WSP's stream restoration approach focuses on restoring open channels to stable planforms and cross-sections that will improve the overall biotic integrity of the system. Our designs rely on native materials for constructing in-stream structures such as rock riffles, log vanes, and root wads for channel stability and aquatic habitat

improvement. WSP has multiple staff with Rosgen, Newbury, and Hey training in channel design and bedload movement. WSP have staff trained in bioengineering and bank stability analysis. WSP recently designed and constructed an award-winning project that included stream relocation to include a stable cross section, riffles, bank full bench, vernal pools, oxbows and a 6-acre wetland.

We have performed numerous lake restorations with services including watershed studies to identify the source of the impairment, bathymetric mapping to identify the location and depth of sediment, dredging plans, nutrient sequestering plans, dredge material disposal plans, invasive plant control, and revegetation and restocking plans. We are experienced in all aspects of permitting for stream and lake restoration including endangered species surveys, Section 401 Water Quality Certifications, Section 404 permits, Notice of Intent, and RCRA if needed. We have experience designing restoration projects for target species, such as endangered mollusks and fish. We have been active in working with the USEPA as part of other agencies on Great Lakes Areas of Concern and the Great Lakes Restoration Initiative (GLRI). We have written four winning grant applications to obtain funding under the GLRI.

At the Kalamazoo River Superfund site, restoration techniques were employed both on riverbanks and in-stream structures. Jhook vanes over 90 feet in length were installed in areas with river flow velocities which exceeded 7 feet per second and are now directing flow back to the center of the channel, working in concert with riverbank treatments. Root wads, footer logs, and woody debris obtained through a mutually beneficial arrangement with MDNR were used to anchor robust bank treatments, which are then planted with native, local seed, live



stakes, and plants designed to grow into grasses, sedges, shrubs, and trees that will fill in the various riparian layers along the riverbanks.

#### 2.1.4 Environmental Investigation/Characterization/Pilot Tests/Feasibility Studies

*Environmental Investigation/Characterization*–WSP has completed environmental investigations at hundreds of EGLE sites of environmental concern and in complex hydrogeologic settings across the entire State of Michigan. Environmental investigations have been completed at UST sites, active and abandoned waste disposal sites, and derelict businesses and manufacturing facilities. These investigations have been completed to satisfy requirements of a vast array of regulations within NREPA, 1994, PA 451 including parts 201, 213, 111, 115 and 22. WSP staff understands that developing a thorough understanding of subsurface lithologic and hydrogeologic conditions is critical to the development of CSMs for the implementation of feasible remedial actions. Our staff has employed the use of investigative tools such as hydraulic probes, hollow-stem augers, rotosonic drilling rigs, laser induced fluorescence and membrane interface probes . We are highly experienced in defining the vertical and horizontal extent of soil, groundwater, soil gas and ambient air concerns, sediments, and subsurface landfill gas impacts. We have completed vertical aquifer sampling

(VAS) to depths of over 600-feet using rotosonic and hollow-stem auger drilling methods. We have installed permanent groundwater monitoring wells and methane gas probes at depths consistent with identified zones of highest impacts. For defining hydraulic characteristics of aquifers, we have developed a "slug test tool" which uses inert gas (nitrogen) versus a metal slug to depress the water column within a well. This technique ensures a higher degree of stress on the aquifer thereby ensuring accurate characterization and eliminating the potential for cross contamination compared to a typical slug test tool.

At the EGLE former Wicks Mancelona Manufacturing site, WSP reviewed historic records, completed VAS activities to depths greater than 600 feet and utilized resistivity and induced polarization methods to obtain aquifer profiles to depths of over 100-feet below static water levels. This data was used to serve as the backbone of a 3-D model to simulate groundwater flow and fate and transport mechanisms. To assist EGLE in engaging the public. WSP developed a website on which the public can review



public, WSP developed a website on which the public can review site data and reports.

WSP has sampled soil, sediments, flora, fauna, water and air throughout Michigan. Our sampling methods have included simple trowels, hand augers, and sampling from various types of drill rigs. Soil samples are classified in the field by our trained geologists and engineers in accordance with the USCS soil classification system. We have sampled sediment throughout the Great Lakes basin using Ponar® samplers, Vibracores®, and hollow stem auger drill rigs from pontoon boats and barges. Our sediment samples are analyzed as bulk sediment, and, at times, we specify that the sediment pore water be extracted and analyzed separately to further evaluate potential risk of exposure to benthic organisms. Surface water samples are typically collected using dip or Kemmerer samplers. We routinely sample ambient air for dust during construction and for chemical contaminants as part of general investigations at sites and during construction activities. Our vapor intrusion characterization sampling methods include vapor sampling from vapor monitoring wells; summa canisters for vapor collection from indoors and sub-slabs; and chamber sampling methods for sub slab and volatilization to outdoor air. On occasion, additional media such as plants (e.g., invasive species) are surveyed and various organisms (e.g., benthos, earthworms, and mice) are sampled. Our samples are packaged for analyses in accordance with EGLE Operational Memoranda and shipped to the EGLE laboratory or to specialty labs as directed by the EGLE laboratory program.

Data generated during site characterization is evaluated to define hydrogeologic conditions, and the extents and degrees of contamination. A CSM is developed and takes into account site soil, sediment, and groundwater characteristics and potential human and ecologic exposure pathways. Available criteria from the Part 201 and Part 213 programs are used to define potentially completed pathways and risks that need to be mitigated. Human or ecological risk assessments are performed when site-specific characteristics are different than those used to develop the generic risk-based criteria, or when generic criteria are not available.

*Pilot Tests*–Pilot tests are completed to evaluate the potential effectiveness of a remedial technology and to collect data in support of the design of a full-scale system. The type and length of a pilot test varies based on the type(s) of remedial technologies being studied. For example, an air sparge (AS)/soil vapor extraction (SVE) pilot test would be conducted at varying pressures (AS) and vacuums (SVE) to determine the optimal radius of influence for the wells and collect air samples to determine the concentrations of contaminants at the varying test points. Results of the study are used to specify system energy requirements, spacing and depth of AS and SVE wells, and identify concentrations of contaminants captured for selecting and sizing components (e.g., cat-ox, carbon, etc.) for treating captured vapor. For an in-situchemical oxidation pilot study an oxidizing agent would be injected into the subsurface at multiple locations which are lined up in a wall formation. The wall consists of two lines, with the injection points installed in a zigzag pattern. The oxidizing agent is then pumped into the injection points. Oxidants are selected based on treatability testing which is dependent on a detailed evaluation of the site-specific conditions during the development of treatability bench testing work plan. Monitoring results are used to determine the effectiveness of the application and provide data for a full-scale injection program.

At the EGLE Alpena Hide and Leather site, WSP conducted a treatability study and onsite pilot test to assess whether a proprietary biochar (BAM<sup>™</sup>) can effectively immobilize and reduce concentrations of PFAS in soil and groundwater to levels that will attenuate over time and reduce the potential impact to the Thunder Bay River and nearby storm water conveyances. The treatability test reduced PFOA and PFOS concentrations in groundwater and soil to below GSI criteria. WSP continues to



conduct groundwater performance monitoring of the pilot test and augmented the pilot test with a resilient, phytoremediation approach that incorporates biochar with TreeWells® to enhance onsite capture of both short and long chain PFAS. Preliminary groundwater and plant tissue sampling results indicate that the TreeWell®-biochar natural "system" creates a measurable capture "cone of depression" that draws contaminated groundwater into the treatment area and removes both short and long chain PFAS from the groundwater. Continued performance monitoring in 2023 will document the extent of contaminant reduction in groundwater with respect to the GSI.

*Feasibility Studies*–Remedial alternatives to address identified environmental risks are developed in consultation with the State and evaluated against agreed upon evaluation criteria. Risk-based corrective action principals are applied in evaluating risks and remedial alternatives at leaking UST sites and sites of environmental concern, e.g., relic waste and industrial sites. On some projects, bench tests and/or pilot studies are conducted in support of evaluating and/or designing alternatives. WSP evaluates each alternative for its implementability, constructability, time frame for remediation, effectiveness in meeting clean up criteria, operation and maintenance requirements, and present worth costs, and presents a recommendation for a selected alternative. Engineering and institutional controls are evaluated as well as active remedial alternatives. To achieve project cleanup goals and close sites, a combination of technologies is often the most efficient approach.

At the Marshall Iron and Metal Site, WSP completed a feasibility study to evaluate remediation alternatives to address the free product migrating onto the adjacent WWTP property. WSP evaluated Excavation and Disposal, In-situ Carbon Adsorbent with Enhanced Biodegradation (BOS 200®), Surfactant Enhanced Vacuum Extraction, and Long-Term Monitoring. WSP presented the results of the feasibility study to EGLE and obtained approval from EGLE's In-situ TAPS Team for the BOS 200 ® remedy.



## 2.1.5 Environmental/Rotosonic Drilling/Well Abandonment

Environmental Drilling-Over the last 33+ years, WSP has installed thousands of soil borings and monitoring wells for EGLE, using rotosonic, hollow stem auger, direct push and mud rotary drilling methods. We have used hollow-stem augers, rotosonic and direct push methods to conduct vertical aquifer sampling, monitoring well installation, soil boring using split spoons to collect soil samples for geotechnical testing. Monitoring wells are usually constructed using 2inch-ID, flush coupled, PVC well casing with 5-foot-long, 2-inch-ID, PVC screen with 0.010-inch slot openings. That being said, well construction specifics are based on actual site conditions and may vary based on a number of factors, such as the depth of the well (stainless steels screens may be needed), contaminants present (e.g., use of 20-slot screens and vertical target installation for LNAPL versus DNAPL release sites), cost (e.g., use of direct push to minimize soil disposal costs, particularly at F-listed waste sites)), the geometry of the target intervals (e.g., screening over a permeable preferential pathway), the intent of the well (e.g., discrete well screens for chemical analyses versus longer well screens for determining flux with passive flux meters) or the need to assess multiple targets (e.g., installing nested monitoring wells or soil vapor monitoring points in in a single borehole), or the presence and/or to protect low permeability confining units (e.g., use of multiple casings via the rotosonic method).

<u>Rotosonic Drilling</u>—In the last 13+ years, WSP has used rotosonic drilling as the preferred method to drill borings. Rotosonic drilling methods are faster for deep borings (especially in bedrock or where subsurface obstructions such as foundations are present) and provide continuous borings for interpretation of the subsurface and screening of potential contamination. A dual string of drill pipe is used to sample and advance the borehole and consists of an inner core barrel sampler and an outer pipe casing. This method also isolates any layers of contamination from "clean zones". A WSP geologist prepares a log describing the materials penetrated at each boring location and each monitoring well construction details.

<u>Well Abandonment</u>—WSP has abandoned hundreds of wells for EGLE. In general, the driller will remove as much of the well piping as possible and the well casing that cannot be removed, and any open borehole, is filled with bentonite grout to within 2 feet of grade using a tremie pipe to prevent bridging. If deemed necessary to completely remove the well casing the entire well can be over drilled and the borehole filled with bentonite. The uppermost two feet is filled with sand and/or gravel to approximately six inches below grade and finished to

grade with concrete, asphalt, gravel, or seed and topsoil, as appropriate, to match the surrounding area. The driller is responsible for the removal and offsite disposal of all well casing, concrete pad, and well vault materials. WSP oversees the well abandonment and provides Well Abandonment Logs to EGLE.

At the EGLE Broadway Coin Laundry site, the largest brownfield redevelopment project in Washtenaw County, WSP installed 15 VAS clusters onsite and offsite, each with several 1-inch piezometers installed at different depths within the borehole. WSP had to obtain Washtenaw County Health Department Soil Boring Permits and Monitoring Well Permits to complete this scope of work. All onsite piezometers were abandoned after sampling to allow for site development. The



drillers used neat cement and ½ poly vinyl tubing to tremie grout into the wells. The tremie tubing was gradually withdrawn as the grout was pumped into the well. The piezometers were then cut off to 2 feet below grade and the remaining borehole filled with soil.

#### 2.1.6 Ground Penetrating Radar/Laser-induced Fluorescence Field Screening

Ground Penetrating Radar-WSP routinely uses various types of surface geophysical techniques such as ground penetrating radar (GPR), magnetometers, electrical resistivity, and conductance frequency domain electromagnetics (e.g., EM-31) to identify subsurface structures such as utilities, buried drums, burn pits, foundations, and underground storage tanks (USTs). GPR is effective in urban/industrial areas where other geophysical methods may not work and can locate metallic and nonmetallic objects including subsurface disturbances such as past trenching of excavation backfill. The GPR system sends radar pulses into the subsurface and is reflected back based on the material encountered in the subsurface. Depth to objects is determined based on processing the sampling interval and determining the anomaly. Different types of subsurface materials such as sand versus clay can affect the GPR results. WSP also uses downhole geophysical methods to define soil structures and groundwater contamination plumes while limiting the need for extensive and costly laboratory analyses or more costly drilling approaches. Our staff has also completed borehole geophysical surveys including electrical resistivity/conductivity, natural gamma radiation and in bedrock, caliper, acoustic televiewer and heat pulse flow meters to define hydrogeologic conditions and zones of particular interest for additional assessment. WSP has the experienced personnel to interpret the results from these geophysical surveys and apply them to the CSM correctly.

At the EGLE Wickes Mancelona site, WSP used a combination of surficial geophysical approaches, which included electrical resistivity and induced polarization (gathered in a single layout; resolution to 200 feet below grade) and P- and S-Wave seismic surveys in an endmoraine/outwash transition zone to collect high resolution subsurface layering data that included identification of



outwash channels/potential preferential groundwater/plume migration pathways and potential erosional surfaces that thinned important subsurface confining units at the former Wickes Manufacturing TCE Plume Site. Results were coupled with natural gamma wells log results (used in mud rotary boreholes/wells; a cost saving measure relative to rotosonic methods) to produce a much more robust, data driven CSM that allowed EGLE and local stakeholders to adjust pumping rates and infrastructure to decrease risk/protect a downgradient municipal well field.

*Laser-induced Fluorescence Field Screening-*WSP has been using UVost<sup>®</sup> and TarGOST<sup>®</sup> technologies routinely on EGLE and other client sites since 2008. We have used these technologies on both upland and in-river sites. UVost<sup>®</sup> is used to define non-aqueous phase liquids (NAPLs) consisting of lighter oils (e.g., gasoline, diesel) and TarGOST<sup>®</sup> is used to define heavier NAPLs (e.g., crude oil and tars), again minimizing the need for extensive laboratory



analyses. UVost<sup>®</sup> makes use of laser induced fluorescence (LIF) whereby low molecular weight aromatic compounds in their NAPL state fluoresce when exposed to ultra-violet (UV) light. UVost<sup>®</sup> uses direct push methods to advance a UV laser into the subsurface that detects and records the resulting fluorescence of simple aromatic compounds such as those present in most fuels (gasoline, diesel, crude oil, and kerosene). TarGOST<sup>®</sup> makes use of the LIF whereby higher weight aromatic compounds in their (NAPL) state fluoresce when exposed to green light (similar to UVost<sup>®</sup> but at a different wavelength due to the increased electron shift caused by additional carbon rings). TarGOST<sup>®</sup> uses direct push methods to advance a green laser into the subsurface that detects and records the resulting fluorescence of complex aromatic compounds such as those present in tar.

At the Former Detroit Refinery site, WSP utilized the TarGOST® technology to help define the extent of subsurface DNAPL. 100 borings were completed in 5 days – saving more the \$65,000 compared to conventional drilling, sampling and laboratory analytical techniques.

## 2.1.7 Landfill Maintenance/Monitoring

Landfill Maintenance–Landfill maintenance consists of routine operations and maintenance as well as a continued evaluation of cost-reduction opportunities. The landfill covers must be maintained to minimize leachate seeps and to minimize stormwater infiltration. Visual inspection of the landfill cap is conducted to note any changes that may have occurred. Animal borrows or erosion channels can be a common problem on landfill caps that must be repaired. Leachate collection systems must be monitored, and sludge must be removed to maintain capture of leachate. Leachate generally requires treatment and is either hauled or pumped to a local wastewater treatment plant or treated onsite. Wells must be maintained to account for damage from subsidence, lawn mowing equipment, and vandalism.
WSP conducted the site maintenance for the Gratiot County Landfill for EGLE. The work activities included soil erosion inspections and repair; landfill cap repair, mowing and brush removal; gate/fence installation, inspection, and repair; and solar vent/flare installation, inspection, and repair.

<u>Landfill Monitoring</u>—Landfill monitoring usually is conducted by collecting landfill gas measurements and leachate and groundwater samples for

analyses. Rates of leachate generation are monitored. The amount and frequency of the sampling may be dictated by the regulations the landfills are operating under or did operate under. A gas probe is used to measure the concentration of methane (CH<sub>4</sub>), carbon monoxide (CO), oxygen  $(O_2)$ , and the percent lower explosive limit in the landfill gas monitoring wells. The results of the gas survey should be compared to historic survey results to monitor any trends. Groundwater monitoring is conducted to evaluate a landfill's potential impact to the surrounding groundwater. Depending on the depth of the landfill and where the groundwater table is located, the landfill can affect the groundwater flow, and characteristics of the leachate. Groundwater sampling should include groundwater measurements to develop groundwater flow patterns and sampling of chemical related to the landfill. Once the data is collected it should be put into a database and evaluated to monitor for any developing trends. Landfills produce leachate for decades after site closure and require a continuous effort of Life Cycle Planning. WSP uses a statistical analysis package to optimize the number of monitoring wells required as well as the frequency of sampling. The Monitoring and Remediation Optimization System (MAROS) software is the most widely used tool for optimization of longterm monitoring networks. This optimization typically consists of identifying wells that are redundant with others in terms of satisfying key objectives such as monitoring source area concentrations over time. When properly applied, MAROS can provide statistical justification for removing these "redundant" wells from monitoring programs.

At the EGLE Fort Gratiot Landfill site, 24 monitoring wells are sampled, and 27 landfill gas vents/gas monitoring points are measured for landfill gas. In addition, several nearby surface water bodies are also monitored for PFAS. As a result of years of monitoring the number of wells be monitored was reduced, thereby saving the State unnecessary costs.



## 2.1.8 Nuclear Waste Manager/Disposal/Remediation

Nuclear waste management and remediation is one of WSP's specialties. WSP's interdisciplinary nuclear Project Team develops and implements integrated solutions that incorporate innovative technologies to address complex radiological, hazardous, and multimedia contamination problems. WSP helps clients move projects through cleanup and regulatory compliance. Sites that were closed out by the Nuclear Regulatory Commission (NRC) before 2000 did not have the same level of review and requirements that are in place under current regulations. Many sites that were closed pre-2000 have been re-evaluated and found to have residual contamination that was missed. The approach for these types of situations is to perform some scoping surveys to assess the potential for residual radiological contamination. WSP often uses portable radiological instrumentation with real-time

response. If elevated levels are found, some volumetric samples may be needed to further quantify risks and identify closure options.

When a specialty subcontractor proposed an unimaginative closure strategy for EGLE's Tobico Marsh low-level radiological waste site, WSP sought a second opinion. Our in-house experts developed a streamlined approach that saved the State \$10 million and was just as protective of the sensitive wetland.



# 2.1.9 Per-& Polyfluoroalkyl Substances (PFAS) Sampling

WSP has made a significant investment to develop our technical expertise in per- and polyfluoroalkyl substances (PFAS), perhaps the most pressing challenge that EGLE is facing. Even before the potential threat posed by PFAS was recognized in Michigan and elsewhere, WSP formed a PFAS Team. WSP's Shalene Thomas leads the Team with David Woodward as the PFAS Remediation technical leader and Sean Gormley as the PFAS Chemistry technical leader. Combined, they offer nearly 40 years of PFAS experience and have executed projects in the U.S., Canada, Europe and Australia.

In 2017 and 2018, WSP reached out to technical staff in EGLE's District Offices through a series of informational meetings aimed at sharing information on PFAS, their historical uses and potential sources, and their behavior in the environment. We also discussed WSP's research for the DoD to identify cost-effective methods for treating PFAS in soil and groundwater.

<u>Sampling</u>-Michigan has been a leader in evaluating PFAS in a variety of media (e.g., via its Michigan PFAS Action Response Team (MPART)). This early action along with a high number of PFAS sources and early projects has allowed WSP's Michigan Team to get early and significant experience associated with sampling/analysis of PFAS. Our Team has collected for PFAS analysis samples of pore water, groundwater, surface water, sediment, soil, aqueous film forming foam (AFFF) used for fire protection, private wells sampling, public water supply wells biosolids, fish tissue, human and wildlife blood samples, various types of waste, wastewater, and various construction materials (steel, PVC, concrete, etc.) that can adsorb PFAS. **Exhibit 2-1** summarizes PFAS related samples collected by our WSP Michigan-based staff by most common media.

Exhibit 2-1. Samples Collected by WSP Michigan-Based Staff						
Soil	Ground Water	Sediment	Surface Water	Process Water	Private Well	
456	1,999	38	148	822	824	

Several of our Michigan-based Team members have supported the development of enhanced sampling protocols and internal standard operating procedures (SOPs), have become internal trainers, and have stayed abreast of MI sampling/analytical guidance, policy, and requirements. The WSP Team also participates in a wide variety of industry groups that are engaged in sampling/analysis issues (e.g., ITRC, ASTM, etc.) and monitors US EPA PFAS method development actions closely. This Team also has access to our PFAS Chemistry Team Leader and subject matter experts (SME's) that include experts in PFAS sampling and analysis. These experts are included on our proposed Team for the State.

WSP has established PFAS-specific project tools in support of quality assurance and control during the execution of PFAS portfolios. Some of the relevant tools to this scope of work include:

- PFAS-specific Standard Operation Procedures (SOPs): WSP has developed more than a dozen SOPs and checklists to ensure sample collection integrity is maintained and cross-contamination is avoided. SOPs for sampling various media as well as daily site checklists are available and can be deployed as required.
- PFAS Team Calibration training program: WSP developed a series of webinar training modules specific to PFAS site investigation planning, field execution, data analysis, and reporting. More than 325 staff (including members on our Proposed Team) from the US, Canada, and Australia have graduated from the calibration training to date. The calibration training sessions ensure teams executing PFAS work across the company do so in a consistent, accurate and complete manner and any new science, policy or guidelines can be easily disseminated and changes implemented throughout the projects efficiently.
- Laboratory Audit program: WSP established a laboratory audit program to perform compliance checks on laboratories providing PFAS analysis as well as evaluate innovative analytical developments (i.e., Total Oxidizable Precursor Assay [TOPS] and Particle Induced Gamma-Ray Emission [PIGE]). Since analyte lists, laboratory certification, analytical methods, and capacity are frequent concerns with PFAS, we established a laboratory audit program to ensure compliance as well as to have the ability to adjust to any changing regulatory standards or guidelines.
- Field Operation Office: WSP has a 4,600 SF field operations facility in Portland, ME. All owned and rented equipment is thoroughly checked, inspected, and calibrated to verify correct operation before it is shipped to the field to prevent equipment-related delays. Within this facility, we house a 400 SF access-controlled storage room dedicated to PFAS program work that confines PFAS-dedicated equipment and consumable supplies that have the potential to introduce cross contamination (*e.g.,* Tyvek, rain gear, field notebooks, Teflon pump tubing, etc.). Only PFAS program personnel are allowed into the secure PFAS Clean Room. We have a dedicated DI water system with a 2-micron effluent filter that is certified clean for PFASs by chemical

analysis each time the treatment components are replaced. This water is used for decontamination of re-usable PFAS program equipment when it returns from the field, and before it is stored in the PFAS Clean Room. These precautions are essential for the integrity of our equipment and resulting data.

Prior to sampling each day, WSP personnel go through the PFAS Protocol Checklist, which ensures that all PFAS containing material are brought or used in the field, including personal hygiene, to avoid PFAS cross contamination.

<u>*Mitigation*</u>-The high solubility and lack of attenuation of PFAS results in large plumes that can move long distances causing PFAS to be a significant concern for risk to human health and sensitive ecological receptors (which can also result in risk to human health via fish or deer consumption risk). This results in an increased likelihood that mitigation measures will be required and may need to be conducted on an emergency basis (*e.g.,* drinking water exceedances). WSP's Michigan-based Team has experience with a wide variety of mitigation measures and interim response actions ranging from immediate operational changes (*e.g.,* suspending use of biosolids) to addressing large scale impacts to residential and municipal water supply wells.

Mitigation and interim response actions must be implemented immediately upon discovering that PFAS have been released in sensitive areas. Drinking water is a particularly sensitive pathway as MI has established several criteria for PFAS that triggers several response actions including well surveys, bottled water programs, community meeting/relations support, interim risk assessment, and offsite supply well sampling. WSP's Michigan-based Team has experience conducting many different types of mitigation/response actions. This experience has resulted in the development of a sequenced list of response actions and often uses Decision Trees to identify potential risks that trigger mitigation measures.

The most common mitigation measures that WSP deployed were related to unacceptable drinking water risks. As a result, our Michigan-based WSP provided bottled water while point of entry treatment (POET) and/or Point of Use Treatment (POUT) systems were designed and installed. Our POET/POUT experience has included reverse osmosis, granular activated carbon, and ion exchange systems and has included the use of NSF certified PFAS POET and POUT systems. Our Team reviewed the PFAS preliminary analytical data as soon as they were sent by the analytical laboratory. If any of the PFAS exceeded any applicable criteria for drinking water, the Team instituted mitigations measures immediately. We also notified the state health department personnel and conducted retesting to confirm exceedances. Our Michigan-based Team has been involved in monitoring >1,500 PFAS POET/POUT systems and more than 15,000 globally as a company. We have also supported and coordinated the connection of affected properties to nearby municipal water lines when available and have coordinated with municipal water purveyors during the installation of PFAS treatment systems in MI.

Additional PFAS mitigation/response actions our Michigan-based Team has been engaged in includes:

- Developing preliminary Conceptual Site Models to use as a tool to identify areas and direction of potential offsite impact
- Interim action remediation including
  - Excavation of soil in high concentration source areas
  - Recovery of PFAS foam accumulated on surface waters
  - $_{\odot}$   $\,$  Installation and management of passive surface water treatment systems
  - Design, construction, startup, and monitoring of PFAS treatment equipment on an existing groundwater pump and treat system
- Coordinate the suspension of ongoing releases (e.g., suspending fire training, biosolids application, wastewater discharges, etc.)
- Supporting and leading public meetings, developing communication and risk bulletins for public
- Conducting preliminary risk assessments as warranted (*e.g.,* unregulated PFAS, deer meat/fish consumption, human blood serum, etc.)
- Large scale interim sediment removal actions involving PFAS waste management
- AFFF release emergency response support

WSP is also actively engaged in research & development (R&D) associated with PFAS mitigation measures through internal R&D program and contract R&D. We were recently awarded a large U.S. Air Force Civil Engineer Center research grant to conduct a pilot study using a novel passive flow through PFAS treatment train to remove PFAS from surface water in drainage systems. Treatment will include proprietary amendments and phyto-treatment.

At Wurtsmith AFB in Oscoda, Michigan WSP collected samples from over 60 residential private drinking water wells and two public drinking water supply wells. PFAS analytical results exceeded the applicable drinking water criteria at one residence. WSP immediately provided the residence with bottled water as an interim mitigation and coordinated efforts to have the residence connected to the closest municipal water main line.



<u>Remediation-</u>WSP uses a multi-tiered approach to stay abreast of and deploy the best available treatment technologies for the remediation/treatment of PFAS in surface water, sediment, soil, groundwater, biosolids, wastewater, and various other waste streams including onsite regeneration or destruction of spent media (e.g., GAC, IX, organoclay). It includes partnering with leading remediation vendors, staying abreast of new developments in literature, engaging in industry initiatives, participating in leadership roles that shape best management practices (e.g., ITRC), and conducting internally funded and contract research and development (R&D). This process is strengthened by our commitment to the collection of high quality, Site specific hydrogeologic and PFAS-related data to develop a strong CSM. Most importantly, despite developing our own technologies we remain technology agnostic and propose the best site-specific solutions for our clients. As discussed more below, we are also focusing much of our R&D on onsite PFAS destruction in anticipation of PFOS/PFOA being designated as federally hazardous under CERCLA and/or RCRA that will trigger increased PFAS waste disposal costs and more limitations on where PFAS waste can be sent.

WSP has extensive experience with PFAS water treatment including large scale municipal water system feasibility studies and pilot testing (*e.g.,* 4,000 gpm supply for the City of Dayton) and small and large scale pump and treat systems (*e.g.,* 700 gpm Pease Air Force Base (Pease AFB)– Portsmouth, NH). At Pease AFB we designed, installed and operate a second treatment system - the first-of-its-kind in the U. S. – a sustainable and cost-effective, regenerable ion-exchange (IX) treatment system to remove PFAS from groundwater. Our PFAS water treatment experience has also spanned PFAS concentrations; from systems that address concentrations barely above drinking water to industrial wastewater (*e.g.,* accumulated fire training water) with PFAS concentrations in 10's of parts per million (ppm) that also include hydrocarbon concentrations >10,000 ppm (*e.g.,* Award winning Mobile PFAS Treatment System designed and deployed for the U. S. Navy at Marine Corps Air Station Miramar – San Diego, CA).

Our Michigan-based Team designed, constructed, and operated an onsite PFAS Treatment Column Study that demonstrated the effectiveness of granular activated carbon and nonregenerable IX resin for a confidential client. In addition, prior to onsite column testing, bench scale studies were completed to select a deposit control chemical that maximized the system uptime by decreasing system fouling during the 3-month study. The system uptime improved by over 300% during the study as a result of the fouling controls WSP engineered and installed for the system. Based on the study results, we generated cost estimates to treat PFAS and other chemicals of concern entering the groundwater treatment system and presented our findings to EGLE. WSP then completed the 100% design for the groundwater treatment system and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 150 gpm, consisting of 3 x 70-cubic feet IX resin vessels for PFAS removal, an air stripper for volatile organic compound removal, and a deposit control and solids management system to maximize system uptime. Our design also included the treatment system building and the controls system to remotely monitor the system to support our client's remedial schedule and planning considerations. WSP assisted the client in procuring construction services for the groundwater treatment system. This included pre-bid meetings, addenda, receiving and evaluating bids. During the construction, WSP managed the construction for compliance with the specifications. This also included daily activity reports, issuing bulletins, and commissioning the system.

In addition, WSP has executed dozens of bench scale, pilot, and full scale PFAS groundwater remediation and treatment projects. These projects have involved several in situ and ex situ technologies including granular activated carbon, regenerable and non-regenerable ion exchange resin, Biochar injections and soil mixing, TreeWell® capture and containment and colloidal activated carbon injections (*e.g.,* PlumeStop®).

Our experience with PFAS remediation/treatment beyond water has included bench, pilot, and full-scale treatment of soil, sediment, sludge, biosolids, and contaminated building materials. Most soil and sediment remediation conducted on PFAS has involved excavation/removal with offsite disposal or destruction and we certainly have significant experience using those approaches. But we have also used capping approaches to reduce leaching and protect storm water (e.g., EGLE-Alpena Hide and Leather), and we have conducted pilot tests using in situ and ex situ soil stabilization (e.g., EGLE-Alpena Hide and Leather). We have also conducted projects involving building materials decontamination (principally associated with AFFF transition, decommissioning Fire Training Areas and/or industrial processes).

Our PFAS R&D Program is very robust with both internally funded projects and >\$6 million in contract research with the U.S. Air Force Civil Engineering Center, U.S. Naval Facilities Command, SERDP and ESTCP programs. These include two parallel SERDP and ESTCP projects (nearing completion) to optimize treatment efficiency, sustainability, and waste minimization, including the use or regenerable treatment media (IX) that is regenerated onsite and on-site PFAS destruction using plasma technology.

WSP has worked with university and industry leaders to develop and test onsite PFAS destruction in various media, using plasma, solid waste gasification technology and Super Critical Water Oxidation (SCWO). Recognizing the need for a cost effective in situ destructive process to treat PFAS, WSP's R&D group continues to work with university and industry leaders at the benchtop and pilot scales to identify and test potential microbial and/or fungal destructive agents.

We are also actively:

- Conducting bench scale R&D on a novel solid waste gasification technology to destroy PFAS waste onsite with the University of Guelph funded under the SERDP
- Conducting pilot scale R&D on a PFAS spent media destruction onsite using Super Critical Water Oxidation (SCWO) with a leading SCWO vendor funded by AFCEC
- Conducting pilot scale R&D on a passive flow through surface water PFAS treatment system using proprietary and non-proprietary sorbents and phyto-polishing
- Funding and conducting a bench scale study with a biotech vendor to further assess six potential microbial strains isolated from Alpena, Michigan that, during preliminary benchtop work, showed viability in PFAS media and the generation of inorganic fluoride ions (i.e., potentially breaking the carbon-fluorine bond) under aerobic conditions.

Members of our Michigan-based Team are playing key roles in this R&D work.

Our Michigan-based Team is also conducting O&M on three pump and treat ground water remediation systems to treat PFAS within the former Wurtsmith AFB that are treating over 44 million gallons a month. Two of these systems have recently been expanded to accommodate additional flow and treatment capacity.

We also have R&D proposals pending for the following innovative remediation/treatment technologies:

- Role of Biofilm Formation on the Sorption Efficiency of Carbon-Based Concentration Treatment Media
- Mechanochemical Destruction of PFAS in Soil with Ball Milling (expanding upon WSP's previous, internally funded R&D)
- Improve understanding of the efficiency, effectiveness, safety, and applicability of boron-doped diamond electrodes electro-oxidation for PFAS destruction in different liquid streams, (expanding upon WSP's previous, internally funded R&D)
- Advancing the Understanding of SCWO for Destroying PFAS-Concentrated Anion Exchange Resin (expanding upon WSP's previous, internally funded R&D)
- Investigation of Factors that Impact Recovery and Destruction of PFAS in Spent Sorbents Generated from PFAS P&T Systems

By partnering with leaders in academia and industry practitioners, WSP is innovating and shaping best management practices for PFAS treatment and remediation. WSP remains

committed to identifying and bringing to our clients innovative and cost-effective long term and permanent (i.e., destructive) solutions to address the growing challenges posed by PFAS.

At Camp Grayling, WSP partnered with REGENESIS and a local Geoprobe® contractor to inject REGENESIS' PlumeStop® Liquid Activated Carbon™ into the aquifer immediately downgradient of the PFAS and PCE plume to create a permeable reactive barrier wall. After four years of monitoring PFAS and PCE concentrations downgradient remain below drinking water and GSI criteria.



# 2.1.10 Phase I/Phase II/Baseline Environmental Site Assessments

<u>Phase I</u>—WSP's Michigan offices have conducted hundreds of Phase I Environmental Site Assessments (ESAs). The purpose of a Phase I ESA is to evaluate the presence or potential presence of recognized environmental conditions (RECs) based on present or past activities on a property or in the vicinity of the property. Phase I ESAs are conducted in general accordance with the United States Environmental Protection Agency's (USEPA) All Appropriate Inquiry (AAI) Rule and ASTM International, Inc. (ASTM) E1527-13. *Phase II*–Based on the RECs identified during the Phase I ESA, WSP develops a scope of work to determine if the RECs have impacted the site. The scope of work may include soil borings, monitoring well installation, soil sampling, groundwater sampling, soil gas sampling and/or indoor air sampling Samples collected are submitted to an accredited or analyses appropriate to the REC being investigated, including any or all of the following: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, PCBs, and/or other appropriate inorganic or organic compounds. The data collected are reviewed to determine if the site is a Facility under Part 201 and the appropriate determination regarding liability is made at that time.

WSP's Michigan staff conducted a Phase I ESA for a confidential client at a facility that had historically been used for industrial processes. RECs included use of ASTs with known releases, former USTs, the former machine shop and associated floor drains, off-site releases, and a former hazardous waste storage area. The Phase II was conducted, including the installation of 17 soil borings and temporary groundwater monitoring wells. Samples collected indicated concentrations of solvents in



groundwater that were, based on their location on the site and groundwater flow direction, attributed to an off-site source.

<u>Baseline Environmental Assessment (BEA)</u>—If a Phase II or other investigations at the Site indicate it is a "facility" under Part 201 then a BEA can be completed to protect the new owner from environmental liability for past contamination. WSP has experience completing BEAs for the State of Michigan and other clients in accordance with Part 201 of NREPA of 1994, as amended and pursuant to Section 20107a of NREPA. Per Section 20126(1)(c) the BEA must be conducted prior to or within 45 days after the date of purchase, occupancy, or foreclosure of the property. Form EQP4025 "Baseline Environmental Assessment Submittal Form" is also completed with the BEA.

WSP, on behalf of the MDNR prepared a BEA for the Milliken State Park in downtown Detroit, the State's first park in an urban area, in order for the MDNR to obtain liability protection from the existing contamination. The MDNR has an obligation to protect site workers, employees, third parties from exposure risks that may exist on the Site. WSP helped the MDNR meet this obligation by documenting the removal and proper disposal of several abandoned containers and preparing a



Section 7(a) Compliance Analysis (also known as a "due care" plan) on their behalf.

### 2.1.11 Remedial System Design/Construction Oversight/O&M/Decommissioning

<u>Remedial System Design</u>–Upon selection of a preferred remedial alternative, the design package is developed for use by the State in procuring a Trade Contractor to construct the alternative. The package includes design specifications and drawings, pay items, and State

contractual requirements (e.g., MICHSPEC<sup>™</sup> or DCSPEC<sup>™</sup>). WSP will assist the State throughout the procurement process, including advertising for bids, assisting in pre-bid meetings, issuing addenda to the specifications, as requested, and evaluating the lowest bids for completeness and responsiveness. We will assist the State in pre-award meetings as requested. Specifications are prepared in Constructions Specifications Institute (CSI) format and provide detailed descriptions of the work, equipment, and performance requirements. A senior engineer is assigned to each design and is responsible for all technical input and quality, assuring that proper engineering techniques are utilized, and that the design will achieve remediation objectives. The design plans and specifications receive an independent review by a senior engineer or construction manager prior to finalization to identify potential conflicts in the plans and specifications, confirm design assumptions, and that the project is biddable and constructible.

Based on results from pre-design investigations, WSP designed an AS/SVE system with 36 AS wells and 17 SVE wells. As part of the design, WSP evaluated an EGLE-owned, AS/SVE system from another project and incorporated it into the Logan's Gas and Deli treatment system. Also, MDOT would not allow any wells or pavement removal in the roadway, so WSP's design included the installation of 13 angled AS/SVE wells to address the contamination



under the road and directional drilling of the AS/SVE HDPE pipes under the road. The treatment system was installed and O&M was completed for three years until the site was remediated, then subsequently decommissioned. WSP conducted a VI investigation and monitored soil gas for one year. Based on the soil gas results, EGLE was able to close the site under Part 213 in 2022.

<u>Construction Oversight</u>–Upon award to a Trade Contractor for construction services, WSP will assist the State in managing their contractor. We will review and approve submittals from the Trade Contractor such as work plans, construction schedules and shop drawings. We will document the work performed and monitor for compliance with the contract documents. WSP will assist the State in reviewing payment requests in accordance with properly completed work and in issuing bulletins for changed conditions. WSP will assist in certifying when Substantial Completion is reached, and in developing and monitoring the completion of punch list items and in completing project close out activities.

During construction, WSP provides office and field construction administration services. A qualified construction manager and experienced resident project representative (RPR) are assigned to the project and are responsible for providing effective administrative procedures to monitor the work progress and quality of the construction contractor. Senior engineering and scientific staff support the project. The construction manager presides over all project related meetings, and prepares the meeting minutes, reviews contractor requests for payment and forwards a recommendation for payment to the agency.

The construction manager works closely with WSP's onsite RPR to confirm that work is completed in accordance with the design package and that the quantity of work included in the pay request has been completed. WSP's RPR monitors the work of the contractor for quality and adherence to the drawings and specifications. Conflicts that arise are discussed with the construction manager and a problem-solving meeting is held which may result in the issuance of a bulletin. The RPR attends the pre-construction meeting with the contractor to discuss work procedures, schedule, quality control procedures, payment procedures, and change order procedures. The RPR also conducts regularly scheduled progress meetings with the construction manager during which the past work completed, future work activities, problems, conflicts, change orders, schedule, and quality issues are discussed. Meeting minutes are prepared to document the decisions made at the progress meeting.

#### WSP has 15 personnel with Michigan Construction Stormwater Certifications, an asset to EGLE in maintaining compliance with sedimentation and erosion control requirements during construction.



When the trade contractor believes the work to be substantially complete the construction manager makes a final site walk over of the site and prepares a punch list of deficiencies of the work to be completed or corrected by the contractor, along with a schedule for completion of punch list items. When the punch list items have been completed another walkover is completed to confirm final completion of the work. The construction manager assures that close out documentation has been provided by the contractor. This documentation includes:

- Substantial Completion Form (with punch list)
- Guarantee and Indebtedness Statement
- Consent of Surety and Power of Attorney
- Final payment request
- Balancing bulletin to zero-out the contract fees.

WSP prepares a Construction Documentation Report that details the work completed and provides documentation of the work.

At the EGLE Harbor Plating Site, WSP designed and then observed and documented the installation of a groundwater collection and treatment system. The system includes two groundwater collection trenches and pneumatic pumps to collect chromium contaminated groundwater. The groundwater is then transferred to a reactor where sodium hydroxide and iron is metered into the reactor to bind the heavy metals into a dense iron solution. The solution then passes through a flocculator/



clarifier, where the heavy metal sludge is deposited into a filter bin for disposal, and the water passes through two 1,500-pound liquid phase carbon vessels before being discharged to the local municipal wastewater treatment plant system.

*Operation and Maintenance*–Many remedial alternatives include operating systems that require maintenance and monitoring. WSP will assist the State in procuring operation and maintenance contractors and in overseeing this work, including active participation in evaluating system performance, monitoring for regulatory compliance and in identifying system modifications to improve performance and/or decrease operating costs. WSP's remedial system designs typically include the requirement for operation of the system by the construction contractor during the first-year warranty period. The specifications for remediation system O&M identify the performance standards and regulatory requirements that must be achieved, typical operation and maintenance activities, preparation of an operation and maintenance manual, and reporting requirements for performance monitoring. WSP has several EGLE certified remediation operators on staff, and others who have years of experience with operation of treatment systems for private clients.

Ensuring that older remediation systems are still the most cost-effective remedies is another means to stretch limited funds. Since site conditions change over time and cleanup technologies advance, remedies should be re-evaluated to verify that they remain the most economical means to addressing risks. If an approach remains valid, operating costs could be reduced by optimizing the existing treatment system or by streamlining operation, maintenance, and monitoring requirements. WSP's multi-tiered Remedial System Optimization process accomplishes this and therefore, can help the State conserve cleanup funds.

WSP's Michigan staff hold multiple industrial/commercial wastewater treatment licenses, including five licenses for carbon adsorption (Class B-3b), three for air stripping (Class A-2d), three for oil/water separation (Class B-2c), two for subsurface disposal (A-1g), one for impoundment (Class A-1d), one for filtration (Class A-2b), and two for ion exchange (B-2b).



#### <u>Decommissioning</u>

Once a site has met the remediation goals, or the project can proceed with monitored natural attenuation, a treatment system can be decommissioned. WSP has decommissioned numerous treatment systems ranging from traditional groundwater pump and treat systems to more advanced systems such as electrical resistive heating (ERH) thermal remediation systems containing hundreds of electrodes.

System decommissioning can include draining tanks, draining and plugging pipelines, disconnecting utilities, abandoning extraction wells, mothballing of equipment per manufacture specifications, removal of equipment for use elsewhere, removal of treatment buildings, closing out permits and overall site restoration. At a former chemical plant in Danville, Illinois, WSP's Michigan staff decommissioned an ERH system. The system covered approximately 37,000 square feet and was located within an active railroad spur. The system included 200 electrodes, horizontal vapor extraction wells, a concrete insulative cap, a 1,500 cubic feet per minute thermal oxidizer combined with a quench/scrubber using sodium hydroxide, and an industrial water softener. Decommissioning included disconnecting



electrical and gas utilities, cleaning and decontamination of the process components and disposal of accumulated knockout and wash down water, sludge, and bag filters as U211 hazardous waste, followed by deconstruction of the piping and treatment components (including wiring, transformers, and control units). Once all above grade equipment was removed, the concrete cap and electrodes were removed and boreholes properly abandoned. The storm sewer components and electrical conduit within the remedial area were replaced and the railroad tracks were reinstalled. A final site walk was performed to confirm all work was completed. Since decommissioning, the property owner has utilized the railroad spur for continued material deliveries with no complications.

# 2.1.12 Specialty Sub-Surface/Utility Inspection/Sewer Camera/Cleaning

<u>Sub-Surface/Utility Inspection</u> – WSP has engineers and professional staff that specialize in surface utility engineering (SUE) work. SUE work includes designating utility lines and the cleaning and inspection of pipelines. Designating subsurface utilities is completed by various techniques depending on the piping material and location. Geophysical designating is the most common method used and can be used if the pipeline is toneable without interference, such as concrete rebar. GPR may also be utilized in instances where utilities are experiencing interference or are non-toneable. Air knife confirmation techniques are also used by WSP in sensitive locations.

#### As part of NAPL delineation at the former Detroit Refinery, WSP conducted a subsurface investigation over the 12-acre site to locate utilities prior to drilling. Ground penetrating radar was used followed by air knife confirmation in areas of soil borings.

#### <u>Sewer Camera/Cleaning</u> - WSP's SUE staff conducts video and

visual inspection of sanitary and process sewer lines to confirm their condition. Standby use of a jet cleaner and vacuum truck, if necessary, to clear sediment or obstructions is often used. The videos are reviewed by an engineer specializing in subsurface utilities to assess the condition of each line or system. Items the SUE Engineer is looking for include open and closed fractures, pipe breaks, joint separation, sags, and infiltration/exfiltration. Following the completion of the fieldwork, WSP provides a written report including a summary of our findings, conclusions, and recommendations. The data package attached to the report includes all video survey documentation collected at the site, as well as .PDF image files of damaged lines. Cleaning of pipelines can be accomplished by high or low-pressure jetting depending on the condition of the pipeline, high pressure air jetting or by vacuum extraction.



Prior to installation of the groundwater collection and treatment system at the former Detroit Refinery, WSP conducted a video inspection of an existing water conveyance pipeline to confirm its structural suitability for accepting treated groundwater for discharge.

### 2.1.13 Underground/Aboveground Storage Tank Removal/Demolition/Soil Excavation/Closure



<u>Underground Storage Tank Removal</u>—Safe removal of underground storage tanks (USTs) depends on understanding and being able to make sure the contractor implements the correct procedures to safely remove the tank, including compliance with American Petroleum Institute Recommended Practice 1604. The general procedure for tank removal is as follows:

- Purge product lines going to and from tank.
  - Remove check valve from pumps associated with the tank
  - Access the dispenser and connect airline and blow product back to the tank.
- Excavate around top
- Vacuum out remaining product from tank
- While monitoring lower explosive limits (LEL's) at 3 levels inside the tank, inert tank by:
  - Compressed air with a venture on top of tank to evacuate all vapors,
  - Use dry ice in bulk and place in tank
- Cut access port to tank with nibbler (air operated device) or reciprocating saw, depending on material of tank (i.e., steel or fiberglass)
- Use vacuum truck to remove remaining sludge inside tank and, if necessary, make a confined space entry and shovel sludge out and place in drums for disposal
- Cut or disconnect tie down straps to concrete dead men if present
- Excavate soils around sides and top of UST
- Pull tank out of excavation with proper weight rated cable or chain.
- Dispose fiberglass UST at landfill with proper manifests
- Verify clean and transport steel tank to local scrap recycler

A site assessment is required, per EGLE Informational Memorandum 3, when a UST system or associated piping is removed, closed in place (when approved) or undergoing change-in-service. Assessment samples can be obtained by borings or collecting samples upon removal of the USTs/pipelines. A confirmed release must be reported if visual or olfactory evidence if contamination is encountered along the piping runs or in the UST excavation after overburden soils and the UST have been removed.

WSP works within Part 201 Rules and the Part 213 Rules (using a Risk Based Corrective Action [RBCA] process) to achieve closure using appropriate technologies in conjunction with engineering controls, use restrictions and monitored natural attenuation (MNA). WSP staff includes 12 certified professionals (CP's) under EGLE's former certification program. All of these professionals have been thoroughly trained in RBCA procedures via EGLE and/or ASTM sponsored training classes. We have applied RBCA techniques to complete risk-based closures

at UST sites regulated under part 213. Important in the RBCA process is the development of a CSM, and source area definition. In particular, WSP staff is experienced in the evaluation of NAPL and determining through ASTM and API methods whether the NAPL is mobile or not. Transmissivity testing is a suitable tool to help determine recoverability and evaluate abatement technologies when in-well LNAPL thickness exceeds 0.2 feet. As part of these assessments, we review and evaluate all migration and/or exposure pathways e.g., fire and explosion, direct contact, indoor air, drinking water and groundwater to surface water as well as potential human and environmental receptors. As needed, interim responses such as free product removal, building venting, or supplying an at-risk population with bottled water have been implemented. Upon completion of the RBCA evaluations, feasible alternatives to achieve closure are evaluated. We have used and implemented property use restrictions, institutional controls, and focused corrective measure at UST sites. Active remediation is taken to a point where engineering and institutional controls can be used to complete abatement of risk and achieve closure. RBCA Tier II and Tier III calculations are utilized for LUST sites to allow continued use of the property and future development with minimal disruption.

At the EGLE 6598 Helen/EI Johnson Services site, WSP conducted a regulated waste survey, an asbestos inspection and developed specifications for abatement of regulated wastes and asbestos, removal of USTs and underground hydraulic lift. WSP provided construction oversight on behalf of State to successfully complete this work.

Aboveground Storage Tank Removal—Removal of ASTs is similar to the process of removing a UST. Removal starts with a thorough understanding of the AST system including regulatory status (e.g., RCRA permits) use of the AST (active vs. long term storage), materials of construction, contents and potential remaining sediment/heel, piping and connections, secondary containment, foundations, grounding systems and any electrical components. Demolition starts with isolation of the tank to a zero-energy state via Lock Out Tag Out procedures. Tank contents are then drained or pumped out and reused and/or properly disposed. Once the level is confirmed, a manway or bulk head is typically opened to facilitate removal of residual liquids and/or solids in the bottom of the tank. This can either be done via confined space entry or by utilizing pressure washers and industrial vacuum equipment. Once the tank is clean, demolition can proceed in a variety of demolition methods including the use of a sheer on an excavator (steel tanks), crushing, and or torching. Depending on the AST material it can be recycled or disposed.

As part of the demolition of the Former Detroit Refinery, WSP removed buildings, piping and several ASTs, including a one million-gallon AST that contained 200,000 gallons of RCRA hazardous waste sludge. WSP arranged for and managed the proper off-site incineration of this waste.





*Demolition*–WSP's Michigan operation has designed more than 50 demolition projects for the State of Michigan and private clients. Demolition work has included single family residences, former small to medium business with buildings, USTs and ASTs and large chemical and automotive manufacturing facilities. Preparation for demolition, a regulated waste survey is conducted to identify and inventory universal wastes (e.g., light ballasts, containers aerosol cans, etc.), asbestos and other potential waste streams having specific management requirements. The sampling of PCB and lead containing materials may also be conducted. Results of the survey are included in the bid package used to procure the necessary trade services. Other aspects of the demolition are also identified during the demolition planning process. These might include utility disconnects, closing of permits, and deenergizing the demolition area.

# WSP provided design and procurement services, and demolition oversight to EGLE to demolish this three-story building in downtown Grand Rapids with a one-hundred-foot-tall smoke stack in preparation for redevelopment.

Soil Excavation—WSP's Michigan operation has designed and provided construction oversight for more than 100 excavation, dewatering, and off-site disposal projects for the State of Michigan and private clients. Excavation has included all types of materials including petroleum-based contaminants, chlorinated solvents, metals, PCBs, and Principal Threat Wastes. WSP has complete design capabilities in our Michigan offices for civil designs including grading plans and cut and fill calculations by Autodesk Civil 3D. WSP volume calculations used for bid quantities consider the type of soil removed to limit the amount of soil excavated. Excavation of clay soils will allow steeper side slopes and reduce the amount of soil excavated, whereas granular soils may have flatter side slopes to prevent side slope failure and would require additional soil to be excavated. If necessary, excavation support systems can be used to reduce the excavation quantity, and all excavations 25 feet or deeper will require an excavation plan sealed by a Michigan Professional Engineer to provide for the safety of workers. WSP has reduced cost on excavation projects where contaminated soils are at depth by stripping off un-impacted overburden and stockpiling the soil for use as backfill rather than hauling it off-site for disposal. Bid quantities take into account the "fluff factor" for hauling soil off-site or bringing backfill soil on-site based on a cubic yard unit rate or use tons when soil density is known or can be estimated. WSP has completed groundwater dewatering calculations (Radial Flow To A Well In A Water Table Aquifer) to determine the number of wells points required for dewatering, and the volume of water removed that will require treatment. WSP has utilized the permitting process for groundwater dewatering treatment systems that could discharge to either a municipal treatment plant under the provisions of an Industrial Pretreatment Permit (IPP), or under the provisions of a General NPDES Permit No. MIG080000 for treated petroleum contaminated groundwater, or an individual permit for non-petroleum contaminated groundwater. WSP's designs often specify the following:

- Requirements for decontamination facilities
- Requirements for an independent soil testing firm

- Specifications of backfill materials
- Existing conditions and proposed grading plans
- Pre-testing of off-site backfill material for geotechnical and chemical analysis
- Verification sampling of excavation sidewalls and floor
- Requirements for compaction testing
- Requirements for water discharge in accordance with an NPDES or IPP Permit
- Requirements for soil disposal
- Soil Erosion Sedimentation Control (SESC) Best Management Practices (BMPs)
- Specifications for site restoration (fine grading, topsoil, seed, mulch, vegetation maintenance).

At the Huron Valley Schools Bus Garage in Highland, Michigan, WSP completed a remedial investigation and UST removal while maintaining full use of the garage, fueling center and transportation area. Corrective actions necessitated the excavation of NAPL contaminated soils beneath a portion of the building. WSP employed the use of helical piles to support the building and complete excavations to a depth of nearly 20-feet.



Specifications for UST and AST removals, demolition and soil excavation are prepared in CSI format and provide detailed descriptions of the work, demolition methods, management of universal wastes, asbestos abatement, management of other waste streams, and performance requirements for site restoration. WSP assists the State in using our specification packages to procure the necessary Trade Contractors. During construction, WSP provides office and field construction oversight services. A qualified construction manager and experienced resident project representative (RPR) are assigned to the project and are responsible for providing effective administrative procedures to monitor the work progress and quality of the construction contractor. The construction manager presides over all project related meetings, and prepares the meeting minutes, reviews contractor requests for payment and forwards a recommendation for payment to the agency. The construction manager works closely with WSP's RPR to confirm that work is completed in accordance with the design package and that the quantity of work included in pay request have been completed. WSP's RPR monitors the work of the contractor for quality and adherence to the drawings and specifications. Conflicts that arise are discussed with the construction manager and a problem-solving meeting is held which may result in the issuance of a bulletin. The construction manager and RPR attends the pre-construction meeting with the contractor to discuss work procedures, schedule, quality control procedures, payment procedures, and change order procedures. The RPR also conducts regularly scheduled progress meetings with the construction manager during which the past work completed, future work activities, problems and conflicts, change orders, schedule, and quality issues are discussed. Meeting minutes are prepared to document the decisions made at the progress meeting.

When the trade contractor believes the work to be substantially complete the construction manager makes a final site walk over and prepares a punch list of deficiencies of the work to be completed or corrected by the contractor, along with a schedule for completion of punch list items. The construction manager assures that close out documentation has been provided by the contractor. This documentation includes the following:

- Substantial Completion Form (with punch list)
- Guarantee and Indebtedness Statement
- Consent of Surety and Power of Attorney
- Final payment request
- Balancing bulletin to zero-out the contract fees

WSP prepares a Construction Documentation Report that details the work completed and provides documentation of the work.

# WSP collaborated with EGLE toxicologists to develop site- specific ambient air monitoring criteria during remedial excavation for three EGLE projects: Forbes Dry Cleaners, Armen Cleaners and Spartan Chemical.

<u>Closure</u>- WSP approaches remediation at each project with the concept of achieving closure with the quickest, most cost effective approach. WSP works within the Part 201 Rules and the Part 213 Rules (using a Risk Based Corrective Action [RBCA] process) to achieve closure using appropriate technologies in conjunction with engineering controls, use restrictions and MNA. Active remediation is taken to a point where engineering and institutional controls can be used to complete abatement of risk and achieve closure. MNA is used when concentration reductions and site specific parameters indicate that site closure can be attained within an appropriate time frame. RBCA Tier II and Tier III calculations are utilized for LUST sites to allow continued use of the property and future development with minimal disruption.

Since 2014, WSP has achieved 31 closures under Part 213 and has three additional closures pending approval by EGLE. We have also obtained no further action (NFA) at other sites, including five at Selfridge Air Force Base.

### 2.1.14 Vapor Intrusion Assessments, Risk Mitigation, Design, Installation and O&M Services

The migration of chemical vapors into occupied buildings (vapor intrusion or VI) can pose a significant risk. WSP's key staff are well-versed in the science of VI and understand Michigan's tiered approach to assessing VI risks, having worked at dozens of VI sites in Michigan, including many State-funded sites.

Assisting EGLE with Redevelopment/Reuses of Properties. A former gasoline station that was also used as an auto repair shop and a dry-cleaning business was redeveloped in downtown Northville as an upscale restaurant. During renovations, an engineered barrier and passive sub-slab vapor mitigation system was installed but



#### was not working effectively. WSP has been assisting EGLE in monitoring indoor air and evaluated the effectiveness of the mitigation system. WSP recommended and assisted EGLE in modifying the system to ensure that the vapor intrusion pathway is adequately addressed. This brownfield redevelopment is heralded on EGLE's website.

WSP has collaborated with EGLE on the development of numerous technical guidance documents related to VI by participating in stakeholder discussions and providing peer reviews of draft guidance documents including the *Guidance Document for the Vapor Intrusion Pathway* (May 2013).

Evaluation of the vapor intrusion (VI) pathway is initiated when information becomes available that a potential source may affect human receptors. Sources may be identified based on current or previous uses of a property or nearby properties or through the collection of soil and/or groundwater data that identifies concentrations of contaminants that may volatilize at concentrations unacceptable for human receptors. Response actions are conducted based on the results of soil vapor samples or indoor air sampling and may include immediate risk mitigation and/or installation of a vapor mitigation system.

<u>Vapor Intrusion Assessments</u>- WSP has completed vapor intrusion assessments at hundreds of sites nationwide, including residential, commercial, and industrial properties across Michigan. Assessment begins with evaluating the lateral and vertical exclusion zones for the COCs. Further assessment is completed at properties within the exclusion zone that are identified to have potential human receptors. These assessments are typically conducted by completing a visual inspection and/or interviewing property owners, collecting exterior soil vapor samples (soil vapor monitoring points) and/or interior soil vapor samples (sub-slab soil vapor pins). If soil vapor analytical results indicate a potential for unacceptable exposures to the occupants of a structure, indoor air samples may be collected to further evaluate the exposure of building occupants. Soil vapor and indoor air samples are submitted under chain-of custody for analysis of VOCs using USEPA Method TO-15.

#### Soil Vapor Sampling

WSP has been installing soil vapor monitoring points for 20 years. WSP has installed both single and multi-depth nested points to evaluate soil vapor conditions. Soil vapor sample monitoring points are typically installed on the exterior of a property using a hand-auger or Geoprobe® drill rig. Soil vapor monitoring points are installed at an appropriate depth to evaluate the source of the vapors and are typically constructed of 6-inch long stainless-steel screens. WSP has also installed sub-slab soil vapor pins to evaluate the vapor intrusion pathway within a structure. Prior to installation of monitoring points or vapor pins, a visual inspection is completed to observe (to the extent practicable) and document the following: occupancy and use; floor plan/layout; foundation construction and condition; potential vapor entry locations (e.g., sumps, drains, joints, cracks, penetrations, elevator shafts, evidence of seepage, odors, etc.); utility corridors; and other potentially relevant observations. Sub-slab pins and soil vapor monitoring points are installed and completed in general conformance with

EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013, as amended). Vapor monitoring point construction details and field observations are documented in field forms.

Prior to sample collection, vapor screening is performed using a daily calibrated PID and a landfill gas meter (e.g., GEM-5000 or similar) for total VOCs, methane, carbon dioxide and oxygen. Soil vapor samples are typically collected using laboratory provided one-liter glass Bottle-Vac<sup>™</sup> sample containers with pressure regulators. Soil vapor samples are collected using helium leak detection techniques in general conformance with Appendix F.3 of the "Guidance Document for the Vapor Intrusion Pathway" (May 2013, as amended). Sample containers are labelled appropriately and placed in a cooler (without ice) to shield them from light. Field data and observations including sample identification, vapor monitoring point location, sample date, time, general weather conditions, barometric pressure, ambient air temperature, preceding precipitation, sample collection method, purged volume, gauge pressure on the Bottle-Vac<sup>™</sup> at start and end of sampling, are recorded on field logs.

#### Indoor Air Sampling

WSP has conducted indoor air sampling at residential and non-residential properties to evaluate whether the VI pathway is complete. Indoor air sampling is generally conducted when soil vapor sample results are above VIAP screening levels indicating the VI pathway may be complete. In certain situations, indoor air sampling may also be completed based on VIAP screening level exceedances of soil or groundwater. Prior to conducting the indoor air sampling, a preliminary building survey is completed to identify conditions that may affect or interfere with the testing. The survey includes completion of EGLE's Indoor Air Building Survey and Sampling Form. A visual inspection of the buildings is completed in the areas proposed for indoor air sampling. The building inspection includes observing the condition of the floors and walls, as well as noting the locations of sumps, drains, seams, cracks, or other penetrations in the slab. The general characteristics of the heating, ventilation, and air-conditioning (HVAC) system are also documented, as well as the presence of fumes or odors, such as cigarette smoke or vehicle exhaust. To the extent practicable, the indoor air samples are collected with the HVAC system operating as it typically does when residents are present.

In addition to direct visual observations, a representative of each property owner is interviewed to obtain building information. This may include engineering information for the HVAC system and the building's construction (e.g., the types and locations of footers and building additions), discussion of potential sample locations, and information on the use and storage of materials that could contribute VOCs to indoor air during the sampling event (e.g., cleaning fluids, coatings, adhesives, solvents, lubricants, fuels, wastes, etc.). Potential interference from products or activities releasing VOCs are mitigated by ensuring that containers are tightly sealed, and/or removing the source from the building (if possible).

After the pre-sampling survey is completed, indoor air samples are collected in general accordance with Appendix F.4 of the EGLE "Guidance Document for the Vapor Intrusion

Pathway" (May 2013, as amended). As appropriate, samples may be collected concurrently with sub-slab soil vapor samples to further evaluate the VI pathway. Indoor air samples are collected using 6-liter, evacuated, stainless-steel SUMMA® canisters equipped with pressure regulators which are calibrated to collect a time-integrated air sample. The regulator calibration is generally determined by the property occupancy (i.e., residential or non-residential). The samples are collected in the expected breathing zone, approximately 3 to 5 feet from the floor, and away from windows or other sources of exterior air leakage.

#### Passive Air Sampling

While typical soil vapor samples are collected as grab samples, passive sampling allows for sample collection over a longer duration (i.e., days or weeks) to provide time-weighted average concentrations. WSP has completed both indoor air and soil vapor sampling using passive methods. Indoor air samples are collected using a tube packed with an adsorbent material. One end of the tube remains sealed and the other is fitted with a sampling cap to allow contaminants to diffuse onto the adsorbent. Passive soil vapor samples are collected by installing a hole to the desired depth. The sampler is connected to a retrieval wire and lowered into the hole. A plug is placed at ground surface. Indoor air and soil vapor samplers are collected after a pre-determined amount of time (varies from days to weeks depending on project requirements) and submitted for laboratory analysis. The laboratory method selected is dependent on the type of sampler used and COCs being evaluated.

WSP completed a vapor intrusion assessment at the EGLE Telecraft Shopping Center site, a former dry cleaning site, to evaluate the vapor intrusion pathway. Monitoring wells and exterior soil vapor points were installed on the site and an adjoining apartment complex to assess the VI pathway. Quarterly samples were collected to evaluate seasonal variability of groundwater (source of vapor contamination) and soil vapor concentrations. Sewer gas sampling was also



completed on the adjoining apartment complex property to evaluate whether the utility corridor may be a preferential pathway for vapor movement.

<u>*Risk Mitigation*</u>-WSP has conducted immediate risk mitigation for the VI pathway at residential and commercial properties throughout Michigan. Risk mitigation measures are generally employed if soil vapor or indoor air results indicate a potential unacceptable exposure to building occupants. These measures are meant to mitigate exposures until additional response actions (if necessary) can be completed (e.g., design and installation of a more robust vapor mitigation system and/or remedial activities). Analytical results from soil vapor samples are compared to Site-Specific Criteria or the Volatilization to Indoor Air Inhalation Pathway (VIAP) Screening Levels, as applicable to the site being evaluated. Indoor air samples are compared to the Recommended Interim Action Screening Levels (RIASLs). If site analytical data confirms a potential risk to human health from the VIAP, WSP has provided immediate mitigation to indoor air. Immediate mitigation typically includes a portable indoor air purifier, such as the Austin Air HealthMate Plus<sup>®</sup> (or equivalent), that contains granular activated carbon. WSP tracks the hours of use of the filter to confirm the carbon is not spent. If a permanent mitigation system cannot be installed within two weeks, or as directed by the State, WSP will conduct indoor air sampling to evaluate the effectiveness of the immediate risk mitigation.

WSP installed air purifiers at the Gilbert Residence site as a temporary mitigation measure under the EGLE Emergency Statewide VI Response contract. The source of the vapors is unknown but suspected to be associated with a former fuel oil tank release. Homeowners reported petroleum odors in the home and four Austin Air HealthMate Plus® air purifiers were deployed within the basement and main floor of the residence. Indoor air samples were collected to verify effectiveness of the mitigation measures.



*Design* -WSP has designed both passive and active systems throughout Michigan. Vapor mitigation design includes performing a diagnostic evaluation to identify the environmental, structural, and operational characteristics that are most likely to be contributing to unacceptable concentrations of VOCs in indoor air. The evaluation includes a visual inspection of the building and discussions with the occupants to identify significant openings in the foundation and conditions that may cause contaminated soil vapor to be drawn into the building.

Historical analytical results for groundwater, soil, soil vapor, and indoor air collected at the site are also considered. Based on the diagnostic evaluation, a conceptual site model is developed to support the selection of a site-specific appropriate mitigation approach to reduce indoor air VOC concentrations to levels that are consistently below the applicable State of Michigan screening levels.

Virtually all mitigation approaches are likely to include identifying and sealing the largest accessible openings in the foundation. These may be obvious such as uncovered sumps, or they may be more difficult to identify such as places where one building addition or material joins another, which are often hidden by molding or trim.

Common mitigation system approaches include a vapor barrier combined with a passive subslab ventilation system (PSVS) or an active sub-slab depressurization system (ASDS). There are many possible technical approaches to vapor intrusion mitigation, and the selection depends on the unique circumstances at each site (considering such things as soil types, building construction and vapor levels).

When combined with an effective vapor barrier, a PSVS provides a preferential pathway for soil vapor beneath the building to escape to the atmosphere. Passive systems are most likely to be effective at buildings with relatively low sub-slab soil vapor concentrations and where indoor

air concentrations are not expected to exceed one-half of the applicable screening levels. PSVSs are least likely to be effective at buildings with relatively high sub-slab soil vapor and indoor air concentrations. In general, WSP has found that a PSVS in combination with a vapor barrier is most effective when designed as part of new construction to ensure the most effective substrate and ventilation layout beneath the building. In addition, under these circumstances, a PSVS is generally designed to be retrofitted as an ASDS if monitoring indicates the PSVS is not performing as specified.

Design of an ASDS for an existing building can be challenging, but a common method used is well-placed suction pits, which can be used in lieu of the sub-slab collection piping. In some cases, it may be possible to use the drain tiles around a building's perimeter as vapor collection piping by using a fan to depressurize the sump. For buildings in favorable (i.e., permeable) soil conditions, a small number of suction pits beneath the building may be a practical and effective way to maintain an outward pressure gradient from the building to the soil.

Pre-design tests (e.g., pressure field extension [PFE] tests) are used to select the proper layout, sizes, and spacing for collection piping/pits, blowers, etc. A PFE is completed to properly design an ASDS for an existing building by determining an approximate radius of influence (ROI) at an extraction point to maintain a negative differential pressure of 0.02 inches of water column (W.C.) under the building slab, in accordance with EGLE's guidance to mitigate unacceptable exposure from the volatilization to indoor air pathway. The PFE is typically completed by installing extraction points (EPs), typically in a 5-inch diameter hole through the concrete slab to apply a negative pressure to the sub-slab material. Temporary test points, as well as existing sub-slab vapor pins, are used to observe the radius of influence (ROI) beneath the concrete slab using a micro-manometer. The PFE test may also identify leakage points including expansion joints, floor to wall joints, and foundation cracks larger than 0.25-inch that require sealing.

Mitigation systems should maintain a continuous outward pressure differential of at least 0.02inches W.C. under the entire slab. The design requires that all lines are labeled, and appropriate signs are installed to provide the contact information should a system be found to be not functioning as installed.

The EGLE provided spreadsheet-calculator ("Rule 290 Calculation Tool for Vapor Intrusion Systems", version March 2, 2018), in conjunction with soil vapor data, is used to evaluate whether a Rule 290 permit exemption is applicable or whether effluent treatment is needed. Prior to using the calculator, WSP verifies that the spreadsheet is up to date. If pre-installation calculations (based on available soil vapor data) indicate that concentrations could exceed the Rule 290 discharge limits, carbon filtration is added to the design. Access ports for sampling the vapor discharge are also included in the design of both passive and active vapor control systems. Schedule 40 PVC pipe, with an appropriately sized wind turbine for a PSVS or inline fan for an ASDS, is used to carry soil vapor to the roof. The pipe diameter is determined during the design phase but is typically between four and six inches. Test ports are included in both passive and active systems to allow the building-to-soil pressure differential to be monitored to determine if the system is performing as expected. Pressure-sensing alarms are included on active systems to provide a visual and audible warning if the pressure differential falls outside of the acceptable range. WSP designs have included both local alarms and alarms capable of remote notification via telemetry or other communication method, based on project needs.

ASDSs designed for single-family homes will typically incorporate a "radon-type" fan (e.g., Fantech® HP-190), while more robust blowers (e.g., Vapor Dynamics Model IC 4519<sup>™</sup> or OBAR Model GBR76-UD<sup>™</sup>) are usually appropriate for commercial or other large buildings.

The final design for the chosen mitigation is provided either by preparation of Construction Specifications Institute bid specifications or incorporated into a Request for Quotation for procurement of a mitigation system installation subcontractor.

WSP completed a design for an active system at the Whittier Cleaners site as part of the EGLE Emergency Statewide VI Response contract. WSP worked with a subcontractor to complete a pressure field extension (PFE) test to observe the radius of influence (ROI) beneath the concrete slab. The PFE test also identified leakage points including expansion joints, floor to wall joints, and foundation cracks. This information was used by WSP engineers to determine the extraction point layout, pipe sizing, and the number and size of blowers required.



<u>Installation</u>- Depending on the project's needs, WSP will subcontract the installation services or will assist the State in procuring the necessary trade services. In either case, quality control and safety are the primary concern during installation. WSP staff will not only understand the design intent but also the thought processes behind it should modifications be needed in response to unforeseen conditions. WSP's experienced design engineers are familiar with State and local regulations and building codes. Design and installation are performed by appropriately licensed professionals.

Sealing of leakage points will typically be completed at the beginning of the installation activities, based on a visual inspection and/or results of the PFE. Sealing of vapor entry points is done using low-VOC caulk, hydraulic cement, proprietary sealants (e.g., Retro-Coat™ caulk), or other approved materials. If a sump is determined to be a source of vapors to the building, it will be sealed and vented to the outside. Additional sealing may be completed during system commissioning, as needed.

WSP provides oversight of the sealing activities and mitigation system installation to ensure the sealing and mitigation measures are completed according to the design. Installation measures are documented and provided in a report to the State.

Upon completion of vapor mitigation system installation, WSP will conduct system commissioning activities. These are often performed in concert with the installer and include ensuring the system is functioning as designed, completion of initial performance monitoring to verify that the mitigation system is controlling vapor intrusion and maintaining indoor air VOC concentrations at levels that are consistently below the applicable State of Michigan screening levels and collecting an effluent sample to verify compliance with emission requirements.

Results from the effluent sample are entered into the Rule 290 Calculation Tool for Vapor Intrusion Systems to assist with the compliance analysis. If the calculator indicates that the effluent concentrations exceed the Rule 290 discharge limits, carbon filtration is added to the system and a sample is collected from untreated and treated effluent to verify effectiveness and compliance with discharge limits pursuant to Rule 290.

WSP completed installation of two active mitigation systems at residential properties adjacent to the EGLE Forbes Dry Cleaner site. One residence was constructed with a crawlspace and the other with a basement. The mitigation system installed within the residential basement was constructed using one extraction point installed in the basement floor and vented outside the structure using one mitigation fan. The mitigation system installed within the crawlspace consists of a vapor barrier with ventilation piping beneath to depressurize beneath the barrier. Two mitigation fans were installed to achieve the require pressure differential beneath the vapor barrier.



<u>*O&M Services*</u>- WSP provides Operation, Maintenance and Monitoring (OM&M) services for vapor mitigation systems. System OM&M can be completed by WSP or, depending on contract and project conditions, the State or property owner may be responsible for ensuring the system is operational. Regardless, WSP typically provides verbal and visual instructions on system operation immediately after commissioning and will provide a copy of the OM&M plan for future reference.

An OM&M Plan is provided for each system installed. The plan typically includes a description of the system; drawings showing the locations of piping, fans, gauges, valves, test ports, alarms, etc.; startup and shutdown procedures; inspection procedures and checklists; and manufacturer's warranty information for the equipment installed.

The OM&M Plan and its attachments serve as notice to owners and tenants of the system requirements and potential risks posed by vapors in the soil beneath the building. This notice

should be distributed to every person who occupies a unit with a system in a treatment area and outlines the responsibility of both the occupant and the building owner.

Ongoing inspections are required to make sure the mitigation system is operating as designed. Sampling and monitoring frequencies vary, based on project need but in general, events are conducted 30 days post-installation and quarterly events thereafter (to evaluate seasonal variations). Sampling frequency is specified in a site-specific post mitigation sampling plan. Monitoring of mitigation systems includes measurements of the pressure differential between the structure and the sub-slab. Monitoring also typically includes indoor air sampling for VOCs and effluent sampling. After each inspection, an Inspection Checklist is generated as a record of the operation and maintenance. The Inspection Checklist will include the findings of the observations made during the inspection. After the initially proposed inspections are completed, the frequency of additional long-term OM&M is evaluated. If performance monitoring indicates that the system is not capable of maintaining acceptable indoor air concentrations, additional assessment and/or modifications to the system are evaluated. Records generated during performance monitoring are placed in the corresponding OM&M plan appendix for future reference and a copy is also maintained by WSP. Results are discussed with the property owner at the time of data collection and provided to the State.

WSP completed performance monitoring for an active system installed at a confidential client. WSP prepared an O&M Plan detailing the system installation and performance monitoring. The O&M Plan was provided to the property owner and the client for reference. Performance monitoring included effluent sampling to verify the system qualified for a permitting exemption under Rule 290, measuring the pressure beneath the slab to verify that minimum required pressure differentials were met, and adjusting the valves on extraction points as needed to maximize differentials beneath the slab. The system is equipped with an alarm that is connected to a gateway/SIM card for telemetry which allows for remote monitoring.



# 2.2 Plan to Accomplish the Project

As requested, this section presents a summary of WSP's plan to execute and complete projects under this contract, followed by a description of the potential work to be provided under this contract.

## 2.2.1 Management Summary

An overview summarizing WSP's proposed management approach is presented below.

<u>Project Initiation</u>—Activities typically included in the project initiation are attendance at a project kick-off meeting. During the meeting, State expectations regarding the project scope, schedule, and budget are discussed and integrated into the project plans. Often a deliverable following the kick-off meeting is an outline of the project scope of work or a draft work plan for review by the State.

*Project Management*—The Project Manager is the primary contact between the State and the Project Team on issues relating to the project scope, schedule, budget, and technical issues. Administratively, these responsibilities are to ensure that the project is proceeding on schedule and that the budgets for the various tasks are maintained. The WSP Project Manager will also have responsibility for technical direction of the work and coordination within the various technical disciplines required to complete the project. The Project Manager will confer regularly with key Project Team personnel to review project status, provide guidance on technical issues, track deliverables to ensure commitments are met, and identify problems or potential problems to be addressed. WSP is experienced with the invoicing requirements under the DTMB Contract. Every month, WSP will submit a Payment Request Form to DTMB for labor expenses and reimbursable expenses as well as a monthly progress report.

<u>Project Planning and Coordination</u>—During this step, WSP will refine the proposed scope and schedule for State approval. Upon approval from the State, the scope of work will be executed according to the approved schedule and budget. As the project proceeds, WSP's Project Manager will keep the State informed of the progress.

Each of WSP's project personnel will be actively involved in the planning processes and in more detailed planning during tasks in which they are directly involved. Face-to-face meetings and conference telephone calls will be held on a regular basis (e.g., weekly or monthly, depending on the degree of current activity) to coordinate work, identify potential concerns and identify solutions, as quickly as possible. Any anticipated variation from the approved scope, schedule, or budget will be discussed immediately with the State. Corrective measures, if necessary to address such variations, will be discussed and implemented with the State's approval.

When progress on the Kalamazoo River Superfund site stalled over complex technical issues, WSP, on behalf of our private client, organized a "Working Group" of technical experts from WSP, EGLE and their outside consultants, and USEPA and their outside consultants. Under WSP's leadership, face to face meetings and regular conference calls are held. As a result, approaches to addressing these complex technical issues were agreed upon and the project is making significant progress.



<u>Cost Management, Documentation and Control</u>—Project costs will be captured using WSP's BST accounting system, which has been approved by the United States Defense Contract Auditing Agency (DCAA). BST is a premier project accounting system module that allows the flexibility to establish budgets for labor hours, cost, and revenue at multiple levels of the project's tasks and subtasks. This information is used by our Project Managers to estimate costs to complete sub-tasks, allowing for corrective actions, as necessary.

Individual cost items are collected within each task and can be readily assembled into detailed documentation as part of our monthly invoices to the State and for future cost recovery actions, if necessary.

A tightly controlled, well documented system for procurement of goods and services is not only important for controlling costs, it is required by our State, Federal, and private clients. Our system is based upon competitive pricing, best value selection, and has passed numerous Contractor Purchasing System Reviews by the federal government.

Another important piece to controlling costs and avoiding unpleasant surprises is the strict management of project members. This begins at the formation of the Project Team and continues through project planning and execution. As the State will hold WSP to its scope, schedule, and budget, each Project Team member will be required to complete their scope, within the schedule and budget.

*Progress Meetings and Reporting*—In addition to the kick-off meeting, WSP conducts regular project status meetings with the State. These are either face-to-face meetings or by teleconference. WSP will also prepare monthly progress reports. These reports will summarize the progress made during the previous period, the progress expected to be made during the upcoming period, problems and/or variations in the scope schedule, or budget, and the associated resolutions, and any daily field activity logs will be attached.

Discussion of various potential issues during an onsite progress meeting at the EGLE Hensley site. Topics included site security, working near the embankment, and drilling near the buried fiber optic cable.



<u>Health and Safety Plan (HASP)</u>—WSP will develop Site-specific HASPs using the current information in accordance with OSHA requirements to minimize the risk to on-site workers from potential chemical and physical hazards at each Site. The HASP will include information on known contaminants, a hazard evaluation, and anticipated level of personal protection, decontamination procedures, and a list of required monitoring equipment. Emergency procedures and telephone numbers will also be included.

WSP will update the HASP for activities to be conducted, as appropriate. All personnel conducting field activities at the Sites, including subcontractors, will be required to read the HASP and must have satisfied the OSHA training and medical monitoring requirements outlined in 29 CFR 1910.120 before being allowed in the exclusion zone. A copy of the HASP will be available on-site during field activities. Daily tailgate safety meetings will be held to discuss each day's activities and any special circumstances or hazards.

<u>Quality Control</u>—Our Team was assembled with quality in mind. Garret Bondy, PE, with more than 30 years of experience working for EGLE and other state agencies, will serve as our QA/QC Officer. He understands the State's expectations. He has experience with a wide range of disciplines and has access to experts within WSP. In this role, Mr. Bondy, PE will ensure that project deliverables are peer reviewed by qualified experts. WSP's Quality Control Plan is described in Article 5 of the Questionnaire.

<u>Database Development and Management</u>— WSP typically approaches environmental data management using EarthSoft EQuIS, a commercial off-the-shelf standard environmental data management application which allows users to interface with most "market share" environmental data analysis packages including but not limited to WSP owned software packages such as EVS (Environmental Visualization System), GIS (Geographical Information Systems), AutoCAD and gINT. We have designed and deployed field data forms on tablets and smart phones for more efficient and accurate collection of environmental data. Data entered into the electronic forms are then downloaded daily, undergo QA/QC, and imported into the relational database.

WSP also provides data management solutions through relational database management system (RDBMS) development services that provide enhanced access and flexibility. Our database professionals often have a background as geologists, biologists, and engineers so they understand that the value of the information being compiled resides in interpreting the data, not simply housing it. We work with our clients to determine the best structure and solution for their database (considering project goals, daily maintenance, hardware and software availability), adding the value expected from an experienced consultant. We have vast experience in legacy data integration, designing and implementing data management protocols, as well as housing and managing client information from multiple sources (i.e., site locations, laboratories, and consultants).

Dynamic CSM Dashboard- The Conceptual Site Model (CSM) for a site is critical in the development of remedial investigations, engineering feasibility studies and remedial design reports. The CSM is often communicated with crosssections typically generated in evenly spaced sections by computer aided design (CAD) staff, in collaboration with project engineers. We have developed innovative software and modeling processes that generate dynamic cross-sections

from a three-dimensional model framework, with direct linkages to a project database. The outcomes include versatile and information-rich visualizations that flexibly display site data.

In addition, we develop GIS-based databases for use in creating CSMs (both 2-D and 3-D) including the identification of areas of concern (e.g., where cleanup criteria are exceeded). We use these databases to produce high quality graphics to present investigation results, to develop and evaluate remedial alternatives and to complete final designs.

#### WSP-Michigan's development and use of a GIS data base and 3D model was key during the evaluation of remedial alternatives and gaining regulatory approval at the Ironton Tar, Ohio Superfund site.

<u>Construction Project Strategies</u>–WSP believes it is important to understand during the design phase how the project will be procured and delivered. The remedial approach is evaluated in

terms of advantages of implementing a performance-based Contracting Strategy or procuring the services using a detailed design package. Each bid item is evaluated to determine if lump sum or unit rate is the best value approach and items are broken down in sufficient detail to facilitate comparison during bid evaluation. An engineering cost estimate is developed and used to compare to the bids received.

At the EGLE Electro-Plating Facility, WSP coordinated with EGLE trade contractor to safely demolish the building, which was along the property line next to an adjacent building. Other challenges included working along the I696 service drive and removing RCRA hazardous water from the building basement.









# 2.3 Experience with Similar Projects

WSP has been assisting the State of Michigan with projects for nearly 40 years. **Exhibit 2-2** provides a sampling of similar projects performed by our proposed key personnel.

Exhibit 2-2. Sample Projects Completed for the State by Our Proposed Key Personnel				
Project Name/Location	Client	Key Personnel	Facility Type	Project Type and Services Offered
17627 Conant Street	EGLE	Garret Bondy Mike McGowan Doug Saigh Lindsey Selvig	Former Gas Station	<ul> <li>Wayne State CURES Pilot Program Support</li> <li>File Review and Data Evaluation</li> <li>Asbestos and Regulated Materials Survey</li> <li>Geophysical Survey</li> <li>Asbestos and Regulated Materials Abatement</li> <li>Subsurface Investigation</li> <li>Bid Specifications</li> <li>Regulated Materials Abatement and Building Demolition</li> <li>UST and UHL Removal</li> <li>Sewer Gas Sampling Program</li> </ul>
6598 Helen/El Johnson Service	EGLE	Garret Bondy Mike McGowan Doug Saigh Lindsey Selvig	Former Gas Station	<ul> <li>Wayne State CURES Pilot Program Support</li> <li>File Review and Data Evaluation</li> <li>Regulated Materials Survey and Waste Characterization</li> <li>Prepare Bid Specifications</li> <li>Regulated Materials Abatement and Building Demolition</li> <li>Subsurface Investigation</li> <li>Sewer Gas Sampling Program</li> </ul>
Alameda LLRW Excavation and Disposal Cell	Confidential Landfill	Jeff Lively	US Navy Waste Disposal	<ul> <li>Investigation of 15 ha area</li> <li>Monitoring of landfill containing radioactive waste</li> <li>Wetland restoration</li> <li>Remedial design</li> <li>Construction oversight</li> </ul>
Alpena Hide and Leather	EGLE	Garret Bondy Mike McGowan Steve Murray Sean Gormley Dave Woodward Len Mankowski Nate Peck Jason Grahn	Former Tannery	<ul> <li>Geophysical Investigation (surface and downhole)</li> <li>Soil and Groundwater Investigation (including bedrock)</li> <li>Statistical risk assessment</li> <li>Deep well abandonment</li> <li>Groundwater surface water interface (CSI) hydrologic assessment</li> <li>Feasibility study</li> <li>Pilot study using innovative PFAS immobilization technology</li> <li>Remedial design and construction oversight</li> <li>Working with municipalities and landowners</li> <li>Community Relations</li> </ul>
Broadway Coin Laundry Part 201 project site in Ann Arbor	EGLE	Garret Bondy Megan Cynar Mike McGowan Steve Murray Nick Rogers Len Mankowski Justin Gal Deanna Hutsell Nate Peck	Former Dry Cleaner	<ul> <li>Environmental Investigation/Characterization</li> <li>Geophysical Studies</li> <li>Vapor Intrusion Investigation and Pilot Study</li> <li>Brownfield Development</li> <li>Assisted EGLE in evaluating protectiveness of developer's mitigation plans</li> </ul>

Exhibit 2-2. Sample Projects Completed for the State by Our Proposed Key Personnel					
Project Name/Location	Client	Key Personnel	Facility Type	Project Type and Services Offered	
Cals Car Care	EGLE	Garret Bondy Mike McGowan Doug Saigh Justin Gal Deanna Hutsell	Former Auto Repair and Dry Cleaner	<ul> <li>Free Product Survey/Abatement</li> <li>Ground Penetrating Radar (GPR)</li> <li>Phase I/Phase II Environmental Site Assessment</li> <li>Environmental Drilling/Well Abandonment</li> <li>Environmental Investigation/Characterization</li> <li>Off-site Vapor Intrusion Investigation</li> <li>Underground Storage Tank Soil Excavation</li> <li>Remediation Systems Evaluation</li> <li>Vapor Intrusion Mitigation Design and O&amp;M</li> <li>Brownfield Redevelopment</li> </ul>	
Collet Dump	Foster Swift	Jason Armstrong	Landfill	<ul> <li>Environmental Investigation (groundwater and methane)</li> <li>Environmental Drilling and Well Abandonment</li> <li>Landfill Maintenance &amp; Monitoring</li> <li>PFAS</li> <li>Subcontractor Oversight</li> <li>Vapor Intrusion Assessment</li> </ul>	
Confidential Landfill	Confidential Landfill	Garret Bondy Sean Gormely Shalene Thomas Dave Woodward Justin Gal	Landfill	<ul> <li>PFAS Remediation System Pilot Studies</li> <li>PFAS Landfill Monitoring</li> <li>PFAS Risk Communication and Public Meeting Support</li> <li>PFAS P&amp;T Remedial Design, Construction Oversight, and O&amp;M</li> </ul>	
Detroit Refinery	Confidential Landfill	Garret Bondy Mike McGowan Nick Rogers Justin Gal Jeshua Hansen Nate Peck	Former Coal Tar Refinery	<ul> <li>Sewer System Evaluation</li> <li>VOCs in Groundwater</li> <li>Soil and Hydrogeologic Investigations</li> <li>Vapor Intrusion and Ambient Air Investigations</li> <li>Interaction with Property Owner/Access Coordination</li> <li>Evaluation of Sample Data</li> <li>RI/FS and Remediation System Design</li> <li>Served as Prime Contractor for Remedial Construction</li> </ul>	
Electro-Plating Services	EGLE	Garret Bondy Megan Cynar Mike McGowan Doug Saigh Len Mankowski Justin Gal Nate Peck Lindsey Selvig	Former Plating	<ul> <li>Brownfield Redevelopment</li> <li>Vapor Intrusion Investigation</li> <li>Soil Characterization Investigation</li> <li>Permeable Reactive Barriers (PRB) Operations, Monitoring, and Maintenance (OM&amp;M)</li> <li>Regulated Materials Survey and Waste Characterization</li> <li>Building Demolition Specifications</li> <li>Building Demolition Oversight</li> <li>Feasibility Study</li> <li>Source Remediation Specifications</li> </ul>	
Forbes Dry Cleaners	EGLE	Garret Bondy Megan Cynar Mike McGowan Nick Rogers Doug Saigh Len Mankowski Justin Gal Deanna Hutsell Nate Peck Lindsey Selvig	Former Dry Cleaner	<ul> <li>Regulated Material Survey</li> <li>Use of Sewer Cameras</li> <li>Design and Specifications</li> <li>Bidding Document Preparation</li> <li>Contractor Procurement Assistance</li> <li>Environmental Investigation and Characterization</li> <li>Construction Oversight/Implementation</li> <li>Vapor Intrusion Investigation and Mitigation System Install</li> </ul>	

Exhibit 2-2. Sample Projects Completed for the State by Our Proposed Key Personnel					
Project Name/Location	Client	Key Personnel	Facility Type	Project Type and Services Offered	
Fort Gratiot Landfill	EGLE	Garret Bondy Jason Armstrong Mike McGowan	Landfill	<ul> <li>Leachate Control</li> <li>Methane Gas Control</li> <li>UST Removal</li> <li>Landfill Design and Specifications</li> <li>Bidding Document Preparation</li> <li>Contractor Procurement Assistance</li> <li>Construction Oversight/Implementation</li> <li>System Operation/Maintenance</li> </ul>	
Former Chemical Plant	Confidential Landfill	Garret Bondy Steve Murray Len Mankowski Justin Gal Jeshua Hansen Nate Peck	Former Chemical Processing and Packaging	<ul> <li>Sewer System Evaluation</li> <li>VOCs in Groundwater</li> <li>Soil and Hydrogeologic Investigations</li> <li>Vapor Intrusion and Ambient Air Investigations</li> <li>Interaction with Property Owner/Access Coordination</li> <li>Evaluation of Sample Data</li> <li>RI/FS and Remediation System Design</li> <li>Served as Prime Contractor for Remedial Construction</li> </ul>	
Former JB Sims Generating Station Harbor Island	HDR	Saamih Bashir Sean Gormley Shalene Thomas Dave Woodward Len Mankowski Justin Gal	Former Landfill	<ul> <li>PFAS RI sampling at a landfill</li> <li>Groundwater conceptual model update</li> <li>Groundwater fate and transport modeling</li> <li>Contractor Procurement Assistance</li> <li>Wetland Mitigation</li> <li>Construction Oversight/Implementation</li> </ul>	
Gudith Road	EGLE	Garret Bondy Mike McGowan Nick Rogers Doug Saigh Anita Emery- DeVisser Len Mankowski Nate Peck Lindsey Selvig	Former Landfill	<ul> <li>Support for Brownfield Redevelopment</li> <li>Remedial Investigation and Feasibility Study</li> <li>Vapor Intrusion to Indoor Air Assessment</li> <li>Evaluation of Current Indoor Air Mitigation Systems</li> <li>Sewer Video Inspection and Jetting</li> <li>Remedial Design to Protect Surface Waters</li> <li>Construction Oversight</li> </ul>	
Harbor Plating	EGLE	Garret Bondy Mike McGowan Jeshua Hanse	Former Plating	<ul> <li>Protection of Wetlands and Stream</li> <li>Focused Investigation and Feasibility Study</li> <li>Remediation System Design and Specifications</li> <li>Construction Oversight/Implementation</li> <li>Remedial System Operation &amp; Maintenance</li> <li>PFAS Investigation</li> </ul>	
Hensley Property	EGLE	Garret Bondy Megan Cynar Mike McGowan Justin Gal Nate Peck	Former Gas Station	<ul> <li>Free Product Investigation and Remediation</li> <li>Brownfield Redevelopment</li> <li>Environmental Investigation</li> <li>Feasibility Study</li> <li>Laser-Induced fluoroscopy (LIF) investigation</li> <li>Remedial Design and Construction Oversight</li> <li>Vapor Intrusion Investigation</li> </ul>	
Kalamazoo River	Confidential Landfill	Garret Bondy Nick Rogers Anita Emery- DeVisser Jeshua Hansen	Contaminat ed River	<ul> <li>Time Critical Removal Action Under Oversight by USEPA Region 5 and EGLE</li> <li>Prepared Planning Documents</li> <li>Pre-Design Sampling to Support Remedial Design</li> <li>Remedial Design and Remedial Action</li> <li>Construction Oversight</li> <li>Community Relations/Multiple Stakeholders</li> </ul>	

Exhibit 2-2. Sample Projects Completed for the State by Our Proposed Key Personnel					
Project Name/Location	Client	Key Personnel	Facility Type	Project Type and Services Offered	
Lower Rouge River- Old Channel RI/FS	Confidential Landfill	Jeff Lively	Contaminat ed River	<ul> <li>Developed Partnership Plan for USEPA and WSP Client</li> <li>Review and Oversight of USEPA Activities</li> <li>Sediment Geotechnical Sampling</li> <li>Streambank Sampling using LIF Technologies</li> <li>Feasibility Study</li> <li>Remedial Design and Construction Oversight</li> <li>Streambank Habitat Assessment</li> </ul>	
Marshall Iron and Metal	EGLE	Garret Bondy Megan Cynar Mike McGowan Justin Gal Nate Peck	Former Scrap Yard	<ul> <li>Free Product Investigation and Remediation</li> <li>Environmental Investigation</li> <li>Utility Inspection</li> <li>Feasibility Study</li> <li>Laser-Induced fluoroscopy (LIF) investigation</li> <li>Remedial Design and Construction Oversight</li> <li>Vapor Intrusion Investigation</li> </ul>	
Michner Plating	EGLE	Carret Bondy Megan Cynar Mike McGowan Doug Saigh Len Mankowski Justin Cal Deanna Hutsell Nate Peck Lindsey Selvig	Former Plating	<ul> <li>Brownfield Redevelopment</li> <li>Phase I Environmental Site Assessment (ESA)</li> <li>Phase II Environmental Site Assessment</li> <li>Regulated Waste Survey</li> <li>Hazardous Building Materials Assessment</li> <li>Vapor Intrusion Investigation and Mitigation System Install</li> </ul>	
Nuclear Fuel Facility Demolition and Remediation	Confidential Landfill	Jeff Lively	Former Nuclear and Fossil Fuel Developme nt	<ul> <li>Facility-wide investigation</li> <li>Pilot and treatability studies</li> <li>Excavation and disposal of radioactive soil and sediment</li> <li>Building demolition</li> <li>Utility inspection and removal</li> <li>Risk assessment</li> <li>Remedial Design</li> <li>Construction Oversight</li> <li>Brook/river restoration</li> </ul>	
Port Granby LLRW Disposal Facility Construction	Confidential Landfill	Jeff Lively	Landfill	<ul> <li>Soil, waste, sediment and groundwater sampling</li> <li>Landfill cell construction to encapsulate radioactive waste</li> <li>Design</li> <li>Building demolition</li> <li>Construction oversight</li> </ul>	
Rose Lake Shooting Range	MDNR	Garret Bondy Mike McGowan Anita Emery- DeVisser Justin Gal Nate Peck	Shooting Range	<ul> <li>Soil Investigation to Characterize Nature and Extent of Lead Impacts</li> <li>Human Health Risk Assessment</li> <li>Ecological Risk Assessment.</li> <li>Treatability Study</li> <li>Focused Feasibility Study</li> </ul>	
Spartan Chemical Site	EGLE	Garret Bondy Megan Cynar Mike McGowan Steve Murray Nick Rogers Doug Saigh Anita Emery- DeVisser Len Mankowski Justin Gal	Former Chemical Processing	<ul> <li>Geophysical Investigation</li> <li>Soil and Hydrogeologic Investigation</li> <li>Feasibility Studies</li> <li>Vapor Intrusion and Ambient Air Investigations</li> <li>Air sparge/Soil vapor extraction (AS/SVE) pilot study</li> <li>In-situ chemical oxidation (ISCO) bench and pilot studies</li> <li>Vapor Emissions pilot study</li> <li>Remedial Design Specifications</li> </ul>	

Exhibit 2-2. Sample Projects Completed for the State by Our Proposed Key Personnel					
Project Name/Location	Client	Key Personnel	Facility Type	Project Type and Services Offered	
		Jeshua Hansen Deanna Hutsell Nate Peck Lindsey Selvig		<ul> <li>Regulated Materials Survey</li> <li>Monitoring Well Abandonment</li> <li>Community Relations</li> </ul>	
Telecraft Shopping Center	EGLE	Garret Bondy Megan Cynar Nick Rogers Anita Emery- DeVisser Deanna Hutsell	Former Dry Cleaner	<ul> <li>Environmental Investigation and Characterization</li> <li>Vapor Intrusion (VI) investigation</li> <li>Sewer Camera Investigation</li> </ul>	
USDOE Uranium Tailings Remediation	USDOE	Jeff Lively	Former Uranium Processing	<ul> <li>Soil, sediment dust, surface water and groundwater sampling</li> <li>Landfilling radioactive waste</li> <li>Monitoring landfill cells</li> <li>Remedial design</li> <li>Construction oversight</li> </ul>	
Former Wickes Manufacturing Trichloroethylene Plume / Mancelona Ml	EGLE	Garret Bondy Mike McGowan Len Mankowski Nate Peck	Industrial	<ul> <li>Remedial Investigation/Feasibility Study</li> <li>Geophysical Survey</li> <li>Rotosonic Drilling and Well Abandonment</li> <li>Vertical Aquifer Sampling</li> <li>Regional 3D Groundwater Modeling</li> <li>Community Relations Support</li> <li>Vapor Intrusion Assessment and Mitigation System Install</li> <li>Surface Water Assessment</li> </ul>	
Wurtsmith	US Air Force	Saamih Bashir Justin Gal	US Air Force Base	<ul> <li>Environmental investigation</li> <li>Vapor Intrusion Assessment</li> <li>PFAS sampling</li> <li>Environmental/Roto sonic drilling</li> <li>PFAS Mitigation/Remediation/O&amp;M</li> <li>Remediation System Design</li> </ul>	

# 2.4 How WSP is Suited to Provide Best Value

WSP is suited to bring best value to the State through unparalleled experience unparalleled experience with EGLE, MDNR, MDMVA and DTMB processes, all supported by the addition of national experts to our Team.

As stated previously, WSP has completed hundreds of projects for the State of Michigan utilizing well defined processes to develop design packages for use by the State. We have assisted the State in the procurement and management of hundreds of Trade Contractors. This experience has given us an unparalleled understanding of DTMB's processes and expectations, as demonstrated below. Our experience and understanding allows us to bring value to the State and ease the burden of overloaded State employees.

# Phase 100: Environmental Investigation/Study

WSP has completed site investigations to identify the nature and extent of soil, sediment, and groundwater contamination, free product delineation, and vapor intrusion. Site investigations have included hydrogeological studies with drilling techniques such as hollow stem auger, direct push technology, and rotosonic drilling, and using innovative direct push displacement techniques such as UVOST screening for free product and a membrane interface probe (MIP) for high resolution assessment of comingled chlorinated VOC (CVOC) and petroleum-related VOC residual sources. Procurement of environmental drilling services will be a competitive three bid process. These projects have involved many techniques, including soil sampling, low flow groundwater sampling, rotosonic drilling, VAS, use of a spectrophotometer, use of the EGLE mobile laboratory, and groundwater in the hyporheic zone, sediment, pore water and surface water sampling. All intrusive field activities require clearance of utilities before intrusive work and are completed under of the provisions of site specific HASP.

For VIAP characterizations WSP has used the following sampling methods: vapor sampling from vapor monitoring wells and sub-slab vapor pins, summa canisters for vapor collection from indoors and sub-slab, and chamber sampling methods for sub-slab and volatilization to indoor air. WSP has extensive experience using field screening methods to assess the VIAP and identify potential preferential migration pathways, including the use of low-level photoionization detectors (PID), a portable gas chromatograph (GC) and GC-mass spectrometers (e.g., HAPSITE®).

Laboratory services will be provided by the EGLE laboratory unless the EGLE PM approves a contracted overflow laboratory. Using the EGLE Laboratory is an integral part of the services WSP provides to the State, and a process that WSP understands very well. WSP notifies the laboratory of an upcoming field event for scheduling purposes, and orders sampling containers using the appropriate form. When samples are submitted to the laboratory, an Analysis Request Sheet accompanies the coolers, with vital information including the Location ID, Location Code, EGLE PM and phone number, EGLE District, Sample collector and phone number, and analytical requests per media. The Analysis Request Sheet also includes a Chain
of Custody section which signed by the sampler and laboratory personnel. Special considerations are be communicated directly to the laboratory manager, such as short hold times, significantly impacted samples, or other unique situations.

Comprehensive reports are developed presenting the data in tabular and graphical formats, maps showing pertinent site features, and comparisons of data to applicable risk based screening levels. Initial assessment reports and Tier II and Tier III assessments are completed for UST projects under Part 213. The reports provide a description of the problem, field activities, a discussion of the nature and extent of contamination, applicable pathways, conclusions from the collected data, and recommendations for additional investigation, or preparation of feasibility reports. The reports include an Executive Summary that provides a summary and conclusions based on the activities completed. An electronic copy of all final reports will be submitted in a Microsoft Word, Excel and AutoCAD, as applicable, and also as a separate PDF file or other formats as requested by the State.

When further risk-based evaluation is required, WSP has completed site-specific ecological and human health risk assessments to determine the site's contamination risk to human health and the environment. These assessments have included the collection of field data, and preparation of analysis and models to support the risk-based criteria.

# Phase 300: Schematic Design

WSP has completed conceptual schematic designs to establish the physical size and arrangement of the remedial activity and its principal systems. Utilities are located based on existing onsite utility maps, discussions with public utilities and, if necessary, geophysical studies to locate and mark utilities.



# Phase 400: Preliminary Design

Typical Detail Sheet

WSP's Michigan offices have full engineering capability including civil and site engineers, electric design, and environmental engineering. WSP's Michigan Offices have completed more than 300 preliminary designs for remedial actions. The preliminary designs have incorporated data from site investigations and pilot studies to lay out remedial systems or define the limits of source areas for removal by excavation. The preliminary design identifies the size and number of treatment system components. For example, for a groundwater or soil treatment system these may include recovery wells, pump selection (e.g., pneumatic, submersible, free product recovery), equipment (e.g., blowers, compressors, air strippers, oil water separators, granular activated carbon, catalytic oxidizers, etc.), building requirements, and expected operation and maintenance requirements. For in-situ treatment using chemical additions these may include preliminary injection locations, number of injections and injection volumes. Soil excavation and demolition designs define quantities and specify grading plans. Preliminary drawings are prepared showing existing site conditions and proposed conditions, specific details, and an outline of proposed specifications.

# Phase 500: Final Design/Bidding Document Design

WSP has completed final designs including bid documents for free product recovery systems, air sparge and soil vapor extraction, in-situ chemical oxidation, in-situ biodegradation, dual phase recovery systems, UST and AST removals, pump and treatment, air stripping, product recovery systems, electric resistance heating enhanced soil vapor extraction, soil excavation, thermal desorption systems, sediment removal, landfill gas migration and monitoring systems, final cover systems, building demolition, stormwater facilities, and soil erosion and sedimentation controls.

WSP Michigan-based staff have completed final designs including bid documents for:

- Free product recovery systems
- Air sparge and soil vapor extraction
- Vapor treatment using activated carbon or thermal oxidation
- Solar powered bio-sparge systems
- In-situ chemical oxidation (injection and soil mixing)
- In-situ chemical reduction (e.g., zero valent iron)
- In-situ biodegradation and bioenhancement/stimulation
- Dual phase recovery systems
- UST and AST removals
- Pump and treatment including carbon and air stripping)
- Groundwater circulation wells/in-well air stripping

- Carbon-based immobilization injections (e.g., PlumeStop®, BOS 100, biochar)
- Product recovery systems
- Electric resistance heating
- Enhanced soil vapor extraction
- Soil excavation and offsite disposal
- Thermal desorption systems
- Sediment removal
- Landfill gas migration and monitoring systems
- Final cover systems
- Building demolition
- Stormwater facilities
- Sub-slab depressurization systems
- Phytoremediation TreeWell® systems

The final design presents system layout (e.g., location of soil vapor extraction wells and piping), equipment specifications and recommended manufacturers (with performance criteria for "or equal" alternates), remediation building construction requirements, and structural slabs, and operation and maintenance performance criteria.

WSP has used both MICHSPEC<sup>™</sup> and DCSPEC<sup>™</sup> for the Division 0 documents and prepares specifications in CSI format for general conditions and project specific technical specifications. Drawings provide site conditions and layout of remedial system components (e.g., recovery well locations, piping runs, building location), and details on construction (e.g., air sparge or soil

vapor extraction wells, trenching, reinforcement bar for slabs), and soil erosion and sedimentation control best management practices.

All bid documents receive constructability reviews by Principal Engineers or Principal Construction Managers for completeness, accuracy, consistency, constructability, and conflicts. This technical review includes an evaluation of details, references, notes, sections, and specifications to confirm consistency of the Bid Documents and identify any omissions, and to eliminate coordination problems prior to the start of construction. The review evaluates the proposed bid items for completeness and evaluate whether standard means and methods can be used to complete the work. The constructability review confirms that a biddable and constructible set of documents will be released.

WSP's remedial system designs often include the ability to remotely monitor and adjust the treatment system (e.g., restart after power outage) which provides for continual system performance observation and reduces O&M costs.

WSP has prepared bidding advertisements for inclusion on SICMAVSS.com, conducted pre-bid meetings and published meeting minutes, issued addenda in response to bidder's questions, and maintained a bidder's list of those attending the pre-bid conference. WSP has obtained the bids from the three low bidders from DTMB and prepared a bid tabulation to compare bids and note any missing information or discrepancy in the bids such as unbalanced bid items. WSP has held pre-award meetings with the low bidder to confirm that the low bidder has an understanding of the intent of the design and to identify any concerns the bidder may have, and present contract requirements, scope of work and schedule, and contract award procedures. WSP requires bidders to demonstrate they are qualified to complete the specialized remedial work at the time of bidding by providing descriptions of similar projects and references. WSP contacts provided references and provides the agency with a recommendation letter for selection of the low bidder, if qualified. The recommendation letter includes a description of references comments, bid tabulation, bidder's list, Section 00500 Agreement or Short Form Contract, and pre-bid sign in sheets.

# Phase 600: Construction Administrative – Office Services

During construction, WSP provides office and field construction administration services. A qualified construction manager is assigned to the project and is responsible for providing effective administrative procedures to monitor the progress and quality of the work. The construction manager presides over all project-related meetings, and prepares the meeting minutes, reviews contractor requests for payment and forwards a recommendation for payment to the agency. The construction manager works closely with the onsite field representative to confirm that the accuracy of the quantity of work included in the pay request has been completed.

WSP reviews general requirement submittals (e.g., HASP, Work Plan, Spill Plan, Schedule), and technical submittals for equipment and materials. Submittal procedures are detailed in the

specifications and discussed at a pre-construction conference, so the contractor understands the obligation for a complete submittal package, and procedures for review and resubmittal, if required. The construction manager also oversees the preparation of bulletins for modifications to the work, and reviews contractor bulletin submittals and backup cost information. If the contract requires testing of materials, the construction manager coordinates with the contractor the testing, quality control and quality assurance procedures, and review of test results. At the completion of the work the construction manager completes a final site walk over and preparation of a punch list of deficiencies of the work to be completed or corrected by the contractor, along with a schedule for completion of punch list items. The construction manager assures that close out documentation has been provided by the contractor. WSP typically develops a project construction report summarizing the work under each pay item, and presents photos, manifests, weigh tickets, etc.

# Phase 700: Construction Administrative - Field Services

WSP provides experienced onsite RPR during construction activities to observe and document the work of the contractor. The RPR attends the pre-construction meeting with the contractor to discuss work procedures, schedule, quality control procedures, payment procedures, and change order procedures. The RPR monitors the work of the contractor for quality and adherence to the drawings and specifications. Conflicts that arise are discussed with the construction manager and a problem-solving meeting is held which may result in the issuance of a bulletin. The RPR also conducts regularly scheduled progress meetings with the construction manager during which the past work completed, future work activities, problems and conflicts, change orders, schedule, and quality issues are discussed. Meeting minutes are prepared to document the decisions made at the progress meeting. When remediation systems are installed, WSP's design engineer makes a final inspection of the system has been installed in accordance with the design documents. A punch list of outstanding items is developed with a schedule for completion by the contractor.

#### Phase 900: Operation and Maintenance Management -Remediation

WSP routinely manages O&M contractors retained by the State for operation and maintenance of remediation systems. In this role, WSP has provided technical assistance to the O&M contractors on equipment and system performance issues, review of operator reports and performance data, issuance of bulletins for modifications to the system, and review of payment requests.

In addition, WSP operates remediation systems and has experienced O&M operators with proper State certifications. Our Michigan-based staff hold 17 treatment licenses, covering seven different treatment classes. WSP's operators are capable of performing routine maintenance, sample collection, system evaluations, arranging for carbon or clay change outs, disposal of sludge (e.g., oil water separator) and other waste under appropriate manifests, repair and

replacement of worn equipment, system performance monitoring, remote monitoring, responding to alarm conditions, completing non-routine work activities, and meeting permit reporting requirements, etc. This experience allows us to effectively manage the State's O&M contractors resulting in efficient, cost-effective remediation systems that move sites to closure.

# 3. Personnel

WSP's Michigan-based staff has successfully completed hundreds of projects for the State of Michigan. These projects have been located across the State and have involved every aspect of the Scope of Work included in the DTMB Request for Proposal. This unsurpassed level of experience means we can deliver technically excellent, cost effective solutions to projects under this contract.

# 3.1 All Personnel by Classification Who Will Be Employed on the Projects

**Exhibit 3-1** provides information on our key personnel and why they were selected. All of these personnel are available for the entire contract period. Of note is that 16 of these 20 personnel are based in Michigan and all of our proposed personnel have Michigan experience. As we have done on similar projects for the State, all of our Michigan based personnel, as well as personnel from our U.S. staff will be available, as needed.

Class- ification	Name/ Registration	Role (Assignment)	Yrs Exp.	MI Exp.	MI Based	Why Selected
P4	Garret Bondy, PE	Program Mgr.; Engineering	39	Yes	Yes	<ul> <li>Over 30 years working for State on projects and over 25 years as Program Manager for multiple State of Michigan Contracts</li> <li>Experience with all aspects of the services being requested by this RFP</li> </ul>
P3	Jason Armstrong, CPG	Project Manager	20	Yes	Yes	<ul> <li>8 years of experience as a Project Manager</li> <li>17 years of experience on landfills</li> <li>13 years of experience on State projects</li> </ul>
P4	Saamih Bashir, PMP, PE	Project Manager	22	Yes	Yes	<ul> <li>Project manager for over 13 years</li> <li>20 years experience on sites of environmental contamination</li> <li>Over 15 PFAS projects for EGLE and DoD</li> </ul>
P3	Megan Cynar,	Project Manager	17	Yes	Yes	<ul> <li>7 years of experience as a Project Manager</li> <li>17 years of experience with Phase I, Phase II, and BEAs</li> <li>10 years of experience on State projects</li> </ul>
P4	Michael McGowan, PE	Project Manager; Engineering, Construction Oversight, O&M	30	Yes	Yes	<ul> <li>Project Manager for over 50 EGLE projects</li> <li>Worked on over 100 state projects in 27 years covering all RFP requested services</li> <li>Expert in DTMB processes</li> </ul>

# Exhibit 3-1. Our Key Personnel's Qualifications Will Ensure Technical Excellence and On-time Execution within your Budget.

Class- ification	Name/ Registration	Role (Assignment)	Yrs Exp.	MI Exp.	MI Based	Why Selected
P4	Steve Murray, CPG	Project Manager; Env. Investigation	37	Yes	Yes	<ul> <li>Worked on over 70 EGLE projects in 30 years</li> <li>Designer/Manager on in-situ bio and chem-ox projects</li> <li>Managing innovative PFAS remediation for EGLE</li> </ul>
P3	Nick Rogers	Project Manager, Env. Investigation, O&M	21	Yes	Yes	<ul> <li>20 years experience working on over 30 State projects</li> <li>17 years experience on RI, FS and treatment system O&amp;M</li> <li>Expert in multiple drilling technologies for soil, groundwater and sediment sample collection</li> </ul>
P3	Doug Saigh, CPG	Project Manager, Construction Oversight	23	Yes	Yes	<ul> <li>17 years experience as Project Manager on State projects</li> <li>Worked on over 60 state projects involving investigations, demolition, and construction</li> <li>Technical advisor on WSP asbestos safety board</li> </ul>
P4	Sean Gormley	PFAS National Lead	35	Yes	No	<ul> <li>Environmental chemist with extensive experience with site characterization, risk assessment, and remediation activities of urban and industrial affected areas, including in Michigan</li> <li>Principal Chemist of WSP PFAS group</li> <li>Led the effort to establish a network of laboratories capable of supporting PFAS projects</li> </ul>
P4	Shalene Thomas, PMP	PFAS National Lead	24	Yes	No	<ul> <li>More than 10 years of PFAS experience</li> <li>ITRC PFAS Co-chair for AFFF sub- team, member of risk/reg sub- team</li> <li>Technical Lead for sites in US, UK, Canada, Australia</li> </ul>
P4	Dave Woodward	PFAS National Lead	35	Yes	No	<ul> <li>Has conducted PFAS investigations, remediation, and R&amp;D globally since 2006</li> <li>PFAS R&amp;D - stabilization, phytoremediation, ex-situ groundwater treatment</li> </ul>
P3	Anita Emery- DeVisser, CMNSP	Env. Investigation	37	Yes	Yes	<ul> <li>Managed more than 25 projects for the State</li> <li>Expert in investigating soil, soil vapor, groundwater, indoor air and sediment</li> </ul>
P3	Len Mankowski, MS	Env. Investigation	18	Yes	Yes	<ul> <li>17 years experience on State projects</li> <li>18 years experience on sites of environmental contamination</li> <li>Expert in geophysical, soil, groundwater, surface water, soil gas, and indoor air investigations</li> </ul>
P3	Justin Gal, PE	Engineering, Construction Oversight, O&M	18	Yes	Yes	<ul> <li>Over 50 remedial designs for VOCs, SVOCs, metals, and PFAS remediation.</li> </ul>

Class-	Name/ Pegistration	Role (Assignment)	Yrs Evp	MI	MI Based	Why Selected
Incution	Registration	(Aborginnent)		Exp.	Buscu	<ul> <li>13 years experience on State projects</li> <li>Member of ITRC PFAS team</li> </ul>
P3	Jeshua Hansen, PE	Engineering	22	Yes	Yes	<ul> <li>Completed over 100 pilot studies, treatability studies and investigations in support of remedial designs</li> <li>Completed over 20 designs for EGLE involving In-situ remediation, soil excavation, cover systems, and groundwater treatment systems.</li> <li>Completed over 30 projects involving O&amp;M of remediation systems.</li> </ul>
Ρ3	Deanna Hutsell, PE	Engineering	20	Yes	Yes	<ul> <li>10 years experience on State projects</li> <li>Completed over 100 Phase I and II, BEA, Due Care projects</li> <li>Completed over 25 designs involving Brownfield Redevelopment, soil excavation, VI mitigation, UST removal</li> </ul>
P4	Jeff Lively, RRPT	Engineering	45	Yes	No	<ul> <li>Completed over 100 nuclear radiation investigation and remediation projects</li> <li>Extensive experience with health risk assessments to develop site specific nuclear radiation cleanup criteria</li> </ul>
P3	Nate Peck, PE	Engineering	10	Yes	Yes	<ul> <li>10 years experience on State projects</li> <li>Completed over 30 feasibility Studies and Pilot Studies for State projects</li> <li>Completed over 40 designs involving soil excavation, In-situ remediation, VI mitigation, groundwater treatment</li> </ul>
P2	Lindsay Selvig	Engineering	5	Yes	Yes	<ul> <li>5 years experience on State projects</li> <li>Completed over 50 Phase I and II, BEA, Due Care projects</li> <li>Completed over 20 asbestos and RMS projects</li> </ul>
Ρ3	Jason Grahn	Construction Oversight, O&M	25	Yes	Yes	<ul> <li>24 years experience on State projects</li> <li>Conducted construction oversight on over 100 projects involving demolition, groundwater system installations, soil excavation, UST removal, AS/SVE, In-situ remediation, and VI mitigation</li> <li>Performed O&amp;M on over 100 projects involving groundwater, AS/SVE, In-situ remediation, and VI mitigation systems</li> </ul>

# 3.2 Resumes of Key Personnel

Resumes are provided below. In accordance with the Request for Proposal, resumes include the following information:

- Name and title.
- Years of experience.
- Roles and responsibilities.
- Direct, or consultant employee.
- Estimated percentage of work time devoted to this Contract.
- Location (city and state).

**Exhibit 3-2** presents our proposed Team and organizational structure. As in the past, additional personnel will support projects, as appropriate. Prior to adding such personnel, WSP will seek approval of these personnel by the State. **Key Personnel Resumes follow** 



Exhibit 3-2. Program Authority and Communication Lines

NOTE: Key Personnel.

# Garret Bondy, PE, Principal Engineer

Roles/Responsibilities: Program Manager, QA/QC					
Years of Experience: 39	Education: BS, Environmental Science Engineering, 1979				
Direct Employee Novi Michigan	Registrations/Certifications: Professional Engineer -				
Direct Employee, Now, Michigan	Environmental, MI, 1990, #6201038030; OH, 1994, #60789				

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

#### Principal Engineer; Confidential Client, Detroit Refinery, Detroit, MI (2002 - ongoing).

Responsible for strategic direction and principal review of key project deliverables. Environmental services to design and implement response measures to mitigate a 12-acre former coal tar refinery site with **free product**, groundwater and soil contamination from coal tar refining wastes (VOCs, SVOCs, metals, and NAPL) migrating toward the Rouge River. Conducted extensive upland investigation, including the use of a **laser induced fluorescence** (LIF) technology (*TarCost®*). Conducted a **regulated materials survey (RMS)** and **lead-based paint sampling** in preparation for building demolition. Developed a **remedial design** to mitigate contaminated groundwater migration to the Rouge River. Developed specifications for demolition of a **one million gallon above ground storage tank (AST)** and disposal of hazardous waste. Designed the **reconfiguration of site utilities** (power, water, and gas), conducted a **vapor intrusion study** and **abandoned monitoring wells** in preparation for **brownfield redevelopment**. WSP provided **construction oversight** during construction of the groundwater capture and treatment system, building and AST demolition and utility reconfiguration. WSP is providing **operation and maintenance** of the groundwater capture and treatment system.

Program Manager and Principal Engineer; ECLE Part 201, Harbor Plating Facility, Benton

Harbor, MI (2005 - ongoing). Responsible for the development of strategic remediation approaches at an abandoned chrome and cadmium plating facility. Various soil and groundwater investigations were conducted and determined that a 1,600-foot-long chromium and trichloroethylene (TCE) contaminated groundwater plume emanated from this former plating facility and was discharging to nearby creeks. The chromium contamination was determined to be both a RCRA Listed and Characteristically hazardous waste by the USEPA and EGLE. A feasibility study showed the best remedial alternative to protect the creeks was groundwater capture and treatment using an iron co-precipitation process to remove the chromium, followed by a granulated activated carbon polish. A remedial design of the system was completed, and the system was constructed with WSP providing construction oversight. The specifications included soil erosion and sedimentation controls, repairs/modifications of an existing building to house the treatment system, a Unipure™ treatment system, and groundwater collection trenches with pneumatic pumps, directional drilling of water transport pipes and air lines for the pumps, and site restoration. Since system construction, WSP has been providing system operation and maintenance (O&M). Conducted a groundwater **PFAS** investigation to characterize site groundwater.

#### Principal Engineer; EGLE Part 201 Wickes Manufacturing 5-Mile-Long TCE plume,

*Mancelona, MI (2007–ongoing).* Responsible for principal review of **investigation** and results using **sonic drilling** to depths of up to 586 feet at a total value over \$3.2 million. The project scope also included conducting investigation [vertical aquifer sampling, **geophysical surveys** (seismic profiling, induced polarity and electrical resistivity, and down hole gamma logging) multiple drilling methods for deep monitoring well installations], community relations for TCE plume extending 5 miles from source area, affecting more than 1,200 properties. To date, 17 **monitoring wells have been abandoned**. Developed and support an interactive web-based GIS web page for displaying project details. Conducted **feasibility study** to evaluate in-situ technologies including in-situ chemical oxidation (ISCO) and enhanced in-situ bioremediation. Monitored natural attenuation approach is currently being taken due to technical constraints.

Program Manager; EGLE Part 201 Cal's Car Care, Northville, MI (2008 - ongoing). Project recognized as a redevelopment "Success Story" by the EGLE. Mr. Bondy was responsible for WSP execution of the project. WSP designed and directed a multi-phase groundwater, soil, soil gas, and indoor air remedial investigation involving commingled releases from leaking underground petroleum storage tanks and a former dry-cleaning business. Identified onsite source areas using passive soil vapor sampling. Planned and implemented multi-phased vapor intrusion assessments at neighboring properties, including the City's municipal offices plus several commercial and residential properties. Assessments involved comparison of groundwater samples to rapidly evolving vapor intrusion screening levels, installation of exterior soil gas monitoring points, analysis of sub-slab soil gas, and indoor air sampling. Coordinated field sampling with **brownfield redevelopment** activities. Investigation results used by developer to include passive vapor mitigation system (VMS) in construction plans. When post-installation indoor air samples showed passive VMS not performing as intended, conducted a focused feasibility study to evaluate potential VMS options. WSP designed recommended modifications, provided construction oversight of the improvements, and conducted performance monitoring to evaluate effectiveness.

Principal Engineer; MDNR Part 201 Former Rose Lake Shooting Range, Bath, MI (2009 - 2019). Responsible for site strategy development with project team. Assisted in development of project scope to characterize the extent of lead contamination at a former skeet/trap shooting range located within a State Game Area that has a wide and deep lead shot pattern and overlaps over 5 acres of wetlands. During the **remedial investigation**, assisted the selection of decision units for multi-incremental sampling investigation, completed sampling, and completed lead stabilization treatability study. Approximately 80 samples were collected from down range areas and analyzed for total lead, and a limited number of samples for TCLP lead. The extent of lead impacted soils was defined using generic Part 201 cleanup criteria. Most of the shot fall zone lies within a scrub/shrub wetland. Site ecological and human health risks to lead exposure are being evaluated using site-specific information. A Baseline Ecological Risk Study was conducted to assess the lead exposure to small mammals, invertebrates, and the overall effect on the food chain. For the feasibility study, completed a technology evaluation for 11.5 acres that were selected based on multi-incremental sampling results. Based on site specific ecological based screening levels, minimized remedial footprint using multi-incremental sampling methods, prepared cost estimates, evaluated technologies for a variety of general remedial responses (e.g., containment, in-situ stabilization, and removal solutions), and conducted several regulatory meetings with MDNR and EGLE wetland permitting officers to select a soil relocation option where impacted soils would potentially be reused for berms at a

200-yard-long shooting range if soils are rendered non-hazardous. Soil relocation option is expected to significantly reduce otherwise expensive disposal costs and dramatically increase sustainability options for similar impacted skeet ranges undergoing remedial evaluations.

Senior Project Manager; Confidential Client, Lower Rouge River-Old Channel, Detroit, MI (2010 - ongoing). Responsible for development of Remedial Investigation/Feasibility Study (RI/FS) SOW attached to Project Agreement and approved by GLNPO. Scope of work includes sediment and porewater sampling, hydrographic surveys, and use of LIF technologies (TarGost®, UVOST®) to identify possible upland sources and potential in river sources consisting of free product to support river restoration efforts. In support of SOW development, managed and reviewed results from historic property uses to identify possible sources and specify sample locations and approaches. Responsible for public outreach program including briefings for EPA-GLNPO, the City of Detroit, the Economic Development Corp., EGLE, and local businesses. Mr. Bondy provided strategic direction and principal review of the feasibility study. A remedial design was completed by WSP, followed by construction oversight of riverbank restoration work.

Principal Engineer; DTMB Part 201/CERCLA Spartan Chemical; Wyoming, MI (2010 – ongoing). Responsible for strategic direction of project and principal review of all major deliverables. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and ISCO bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A regulated materials survey, geotechnical investigation, and waste characterization sampling were completed, and multiple monitoring wells were abandoned in preparation for the full-scale soil excavation work. WSP will provide construction oversight on behalf of EGLE during the full-scale soil excavation.

Senior Project Manager; Confidential Client, Kalamazoo River Superfund Site, MI (2013 – ongoing). As Senior Project Manager responsible for developing strategic direction of investigation and feasibility studies for four separate sub-reaches of the river. Primary contaminant is PCBs in sediment and floodplain soil. Investigation work includes hydrographic surveys, sediment and soil sampling, fish collection and tissue analysis, geotechnical investigation and the evaluation of remedial alternatives involving dredging sediment capping and natural recovery. Working with risk assessors and statisticians within WSP, USEPA and EGLE (and their consultants) to evaluate river ecosystem restoration, including decreasing PCB concentrations in fish tissue. WSP completed two remedial designs for two sub-reaches of the river, followed by construction oversight during removal of a dam water control structure, sediment dredging and wetland restoration.

Program Manager and Principal Engineer; EGLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2015 - ongoing). Program Manager for design and implementation of a phased remedial investigation that included electromagnetics (EM-31), ground penetrating radar (GPR) and down hole gamma logging, direct push, test pitting, pore water, storm water and surface water sample collection. RI activities included delineation of metals-related impacts in soil and groundwater using sonic drilling methods and assessment of migration into and along historic tannery and municipal storm water utility infrastructure. Constructed Conceptual Site Model (CSM) for use in a focused feasibility study to address metals and buried hides at the Site, which were subsequently excavated as part of two IRMs. Worked with WSP and EGLE toxicologists to develop site-specific criteria for lead and arsenic using results from an in-vivo bioavailability assessment (IVBA). PFAS were identified in Site soil and groundwater. WSP characterized PFAS in soil, groundwater, and surface water, collected additional data to support CSM development and implemented PFAS immobilization bench top and pilot scale studies at the Site. Pilot test studies performed at the Site included: direct push injection and soil mixing of biochar into the formation to reduce PFAS concentrations/migration in groundwater and to reduce infiltration into the submerged, impacted storm water infrastructure; emplacement of biochar mitigation materials into historical storm water infrastructure to mitigate direct migration of PFAS to the Thunder Bay River and recent studies to assess microbially enhanced transformation and/or destruction of PFAS using endemic microbes. WSP provided oversight of well abandonment and completed a remedial design, followed by construction oversight of a focused paved "cap" to reduce leaching to groundwater from vadose soil and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors.

Program Manager; EGLE Part 201, Marshall Iron and Metal, Marshall, MI (2015 – ongoing). Responsible for overall project execution and quality. WSP conducted an **investigation** which included LIF to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP prepared design bid documents for soil excavation and removal of NAPL, transportation, disposal to an approved landfill, backfill, and site restoration. WSP assisted EGLE in procuring a trade contractor and provided construction oversight during construction activities. WSP collected verification samples for laboratory analyses. Upon completion of the excavation activities, WSP prepared a construction report summarizing the activities. WSP completed an offsite investigation and determined NALP extended to the adjacent property. WSP developed a feasibility study which recommended an in-situ enhanced bioremediation remedy using BOS®200 to remediate the offsite property. WSP conducted a **pilot study**, developed bis specifications, and assisted EGLE with contractor procurement. WSP conducted contractor oversight of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP conducted soil gas survey of the offsite building. WSP installed soil vapor pins in the building. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

*Principal Engineer; Confidential Client, Former Chemical Plant, Danville, IL (2017–ongoing).* Provided technical review for development of CSM in support of **feasibility study** and subsequent **remedial design** for remedy to remove **free product** from the source area and control residual carbon tetrachloride contamination in groundwater. Selected remedy was electrical resistive heating (ERH). Developed remedial design, drawings, and bid package.

Provided **construction oversight**, including review of contractor submittals. Worked with the primary ERH contractor, hazardous waste contractor, and other lower tier subcontractors to coordinate and facilitate the success of the project. This project was developed in accordance with an Illinois EPA approved RAP for the **mass reduction of approximately 225,000 pounds** of carbon tetrachloride, and other chemicals, across approximately one acre to a depth of up to 31 feet at this active chemical facility. The RRH system utilized ERH collocated with vertical SVE wells with additional horizontal SVE network, all overlain with an insulative vapor barrier.

Program Manager; EGLE Part 201, Broadway Coin Laundry; Ann Arbor, MI (2017 - ongoing). Supporting brownfield redevelopment of this former dry cleaner property. Designed and implemented a series of geophysical profiles (resistivity/IP profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. Geophysical results used to focus downgradient vertical aquifer sampling (VAS) locations. Coordinated project team throughout remedial investigation to assess tetrachloroethylene (PCE) impacts to soil, soil gas and groundwater beneath and downgradient of the site. Obtained property access and soil permits for on- and offsite sampling. To assess GSI risk, contaminant fate and transport was assessed for possible migration into nearby water bodies (Taver Creek and Huron River) and the shallow and deep groundwater systems. VAS borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Organized field efforts to redevelop existing groundwater monitoring wells, install additional monitoring wells using **sonic drilling**, and sample the wells to further analyze the contamination extent. Conducted pilot testing using **PlumeStop™**. Conducted engineering evaluations and oversight of **pilot testing** being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess performance of the pilot study and evaluate potential additional downgradient investigation and remediation.

*Program Manager; EGLE Part 201, Telecraft Shopping Center, Redford, MI (2017 - ongoing).* WSP reviewed project deliverables and developed project approaches. WSP conducted a soil, groundwater, and **soil gas investigation** of a (PCE) plume associated with a former dry cleaner, which extends beneath a residential apartment complex, located immediately downgradient of the Site. Additionally, the Rouge River is located approximately 1,000-feet downgradient of the Site. To assess GSI risk, contaminant fate and transport was assessed for possible migration to the Rouge River. Evaluation of the vapor intrusion pathway related to shallow groundwater on the adjacent residential apartment complex is ongoing, as well as quarterly groundwater and soil vapor sampling. Additional assessment of the soil vapor pathway was conducted at the apartment complex by completing vapor sampling and a **camera survey within the sewer lines.** Soil, groundwater, and soil vapor data collected is currently being evaluated by the project team for use in preparation of a focused feasibility study.

*Program Manager; EGLE Part 201, Hensley Property, Marshall, MI (2017 – ongoing).* Responsible for strategic direction of this **brownfield redevelopment** project and overall execution by WSP staff. WSP conducted a limited **investigation** which included use of **LIF** to determine the extent of **NAPL**, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP developed a **feasibility study** which recommended an In-situ enhanced bioremediation remedy using BOS®200 to remediate the property. WSP conducted a **pilot study**, developed **design bid specifications**, and assisted EGLE with contractor procurement. WSP conducted **contractor oversight** of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP completed a **vapor intrusion** investigation by installing soil vapor points and collecting soil gas samples. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Program Manager; EGLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 - ongoing).

Responsible for strategic direction of this project and project delivery by WSP staff. A condominium complex consisting of 10 buildings was developed as a **brownfield project** over this unlicensed former landfill. There have been occurrences of **free product** in some of the building basement sumps and there have been odors described as oil or solvent odors and sub-slab vapor extraction systems were installed. WSP was hired to conduct an **investigation** of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, **install and sample sub slab vapor pins** and inspect and seal cracks and joints in the basements. WSP also inspected the adjacent stormwater sewer system using **sewer cameras** to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the **sewer was cleaned by jetting**. WSP then developed **design specifications** for **dredging the detention basin** to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided **construction oversight** of the contractor on behalf of EGLE.

*Principal Engineer; Confidential Landfill, MI (2018 - ongoing).* Samples from the onsite groundwater treatment system showed PFOS and PFOA above USEPA health advisory levels and above Michigan health-based drinking water values. To evaluate potential PFAS treatment upgrades for the system, Wood **designed, constructed, and operated** an onsite **PFAS** Treatment Column Study that demonstrated the effectiveness of GAC and non-regenerable IX resin. Wood **designed the groundwater treatment system** and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 140 gallons per minute, consisting of 3 x 70-cubic feet ion-exchange resin vessels for PFAS removal, an air stripper for VOC removal, and a deposit control and solids management system to maximize system uptime. The design also included the treatment system building and the controls system to remotely monitor the system. WSP is providing **construction oversight** of the modifications. Once the system is constructed, **Wood will provide operation and maintenance services for our client**.

*Program Manager and Principal Engineer; ECLE Part 201, Fort Gratiot Landfill; Landfill Cover System Design; Port Huron, MI (2018 – ongoing).* Principal in Charge for the implementation of a remedial action at a 19-acre Part 201 landfill. Provided final review of **design** and **construction oversight** of a dual composite geosynthetic final cover system for the landfill, a leachate control system consisting of a leachate and groundwater interceptor trench, a passive landfill gas venting system, storm water management facilities, SESC controls, and the construction of islands within the existing **pond and wetlands** to create habitats for migratory

birds. Also responsible for the successful **removal of a 10,000-gallon UST**, culvert replacement, ditch construction, and weir construction to restore the onsite pond and to mitigate flooding of the surrounding adjacent properties, implementation of an onsite and offsite **PFAS** surface water and groundwater investigations, **assessing feasible alternatives for treating PFAS** in the groundwater and leachate generated at the facility, upgrading the groundwater/leachate collection system components and system controls, and implementing a **long-term landfill gas and groundwater monitoring program**. Provided review during construction of the remedies, reviewing shop drawings, survey data, test results, and directed walkover inspections for substantial completion. Program Manager for the Fort Gratiot Landfill **O&M program** which includes maintenance of the landfill cover system, landfill gas venting system, groundwater/leachate collection and pumping system, and storm water facilities at the site.

Program Manager; EGLE Part 201, Michner Plating, Jackson, MI (2018 - ongoing). As Program Manager, assisted in reviewing project deliverables and development of project approaches for this former plating facility adjacent to the Grand River. Scope involves conducting Phase I &II Environmental Site Assessments, and an RMS. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical- and petroleum-stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of **PFAS.** As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the installation of two vapor mitigation systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

*Program Manager; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 – ongoing).* WSP reviewed project deliverables and developed of project approaches in support of **brownfield redevelopment.** WSP completed an **RMS** as part of the pre-design investigation. The **RMS** included **asbestos, lead-based paint sampling**, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed **design specifications for site remediation** that included estimates of the building demolition and

developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

Program Manager; EGLE Part 201, 17627 Conant Street, Detroit, MI (2019 - ongoing). Responsible for strategic direction of the project. WSP implemented and conducted/managed the building demolition and a site-wide subsurface soil and groundwater **investigation** in support of **brownfield redevelopment**. Scope of work included historical records review, **asbestos inspection**, **lead-based paint sampling**, **and an RMS** and preparation of a characteristically hazardous building materials evaluation. WSP developed **design bid specifications** for building demolition. WSP assisted EGLE with procurement of a demolition contractor and conducted **oversight during the demolition**. WSP is currently completing the construction documentation report.

*Principal Engineer; ECLE Part 201, 6598 Helen Street, Detroit, MI (2020 – ongoing).* Responsible for strategic direction of the project. This **brownfield redevelopment** project began as a **remedial investigation** of soil and groundwater at this former gas station. WSP conducted an **RMS.** The survey included **asbestos, lead-based paint**, and stained concrete sampling. Based on the results of the RI and **RMS**, WSP developed **design bid specifications** to demolish the building, **remove the USTS**, and **excavate impacted soil.** WSP assisted with Trade Contractor procurement and provided **oversight** of the construction activities consisting of UST removal, soil excavation and building demolition.

Program Manager and Senior Reviewer, ECLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 - ongoing). A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Site CSM and conducted a subsequent **data gap investigation** to support **remedial design**, PRB performance monitoring plan and **VIAP assessment** work plan to address residual hexavalent chromium, PFAS, TCE and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a **focused feasibility study** to address the residual source and provided stakeholder outreach support and PRB **operation**, **monitoring**, **and maintenance** in support of EGLE. WSP developed **design bid specifications** for the demolition of the Site building, which was funded through a **Brownfield Redevelopment** Grant. WSP completed an **RMS** as part of the predesign investigation. The **RMS** included **asbestos**, **lead-based paint sampling**, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted **construction oversight** during the demolition. After the building was demolished, WSP conducted a waste **characterization investigation** of the soil and groundwater. WSP is currently completing a **bench study** to determine amendment mix ratios needed to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the in-situ remediation of soil and groundwater which may also include excavation.

**Program Manager and Principal Engineer; ECLE Part 201 Gratiot County Landfill Site, St. Louis, MI (1996-2017).** Responsible for the development and implementation of project strategic approach and final review of primary project deliverables. WSP is conducting landfill **monitoring, operation and maintenance** activities. The cap repair project involved the remedial design for repairs to the cover system, which was affected by differential settling. The **remedial design** included a grading plan and revised topography, fill soil requirements, modifications to a leachate storage lagoon outlet, modification to passive and active gas vents, and collection and disposal of refuse and trash from an adjacent EGLE-owned property. WSP conducted **construction oversight** for the landfill modifications.

*Project Engineer; Confidential Client, Mishawaka, IN (2011-2013).* Demolition of an 82,000 square foot facility formerly used in the testing and manufacture of guided missiles. Work consisted of pre-demolition **Regulated Materials Surveys (RMS)** that included **an asbestos survey, lead-based paint sampling**, testing of potential hazardous materials and **radiological screening**. WSP developed **design demolition specifications** and procurement plans. Under **construction oversight** by WSP, the building structures were razed to the ground surface and materials recycled or disposed according to the specifications.

*Principal Engineer; Confidential Client, Landfill Cover System, Ironton, OH (2014-2016).* Responsible for **remedial investigation** and **feasibility study** to evaluate remedial alternatives to address free product and soil contamination at this former chemical plant property. Work included a **pilot study** to evaluate recovery of **free product**. As part of the **remedial design** team, was responsible for strategic direction of WSP's remedial design of the landfill cover system. The 16-acre project included the consolidation of onsite impacted soil to create a mound, a dual composite liner system, drainage layer, and vegetative layer, storm sewer system, passive gas system, and rerouting of free product/groundwater pumping well piping. WSP provided **construction oversight** during construction of the landfill cover system.

# Jason Armstrong, CPG Senior Hydrogeologist

Roles/Responsibilities: Project Manager			
Years of Experience: 20	Education: BS, Environmental Geosciences, 1999		
	Registrations/Certifications: American Institute of		
Direct Employee, Novi, Michigan	Professional Geologists, Certified Professional Geologist		
	(CPG), #11470		

#### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

#### Task Manager; Project Geologist and Field Lead, Confidential Client, Collett Dump Site, Brighton Township, MI (2008 – ongoing). Task Manager, Project Geologist, and Field Lead in charge of providing technical support at an unregulated dump site. Routine activities include coordinating and implementing a long-term groundwater monitoring and site maintenance program, preparing and implementing a contingency plan with respect to off-site impacts and soil vapor migration, and regulatory reporting to document that the VOC impacts in the groundwater and soil vapor have not migrated, and do not pose a threat to down-gradient residential water wells and/or structures. Responsible for routine environmental monitoring surveys that include groundwater and drinking water samples which are collected in accordance with approved sampling plans. Also responsible for developing a conceptual site model and interpreting groundwater elevation contour diagrams for multiple flow systems beneath the site, which are summarized in routine regulatory reports. Negotiated with the EGLE to optimize monitoring plans and reduced the required and ongoing monitoring and reporting frequencies for the site. Also involved in the initial development and revisions of a local ordinance restricting the usage of groundwater in certain areas.

Project Manager and Project Geologist; EGLE Part 201, Fort Gratiot Landfill, Ft. Gratiot, MI (2018 - ongoing), Project Manager in charge of staff and resourcing management, budget tracking, subcontractor oversight, data interpretation and analysis, and reporting at a 19-acre Part 201 landfill. Routine activities include groundwater, surface water and landfill gas monitoring, compliance reporting, and managing the implementation of a remedial investigation to delineate on and off-site PFAS impacts originating at the site. Responsible for routine landfill gas and groundwater monitoring data collection, data analysis, interpretation and reporting to assess the migration of both methane and impacted groundwater beneath the landfill and in the vicinity of nearby residential properties. Also responsible for ensuring the proper O&M of an underground groundwater and leachate collection system, and oversight of O&M subcontractor activities. Recent activities have included coordinating and implementing an on-site and off-site PFAS impacts investigation, assessing feasible alternatives for treating **PFAS** in the groundwater and leachate generated at the facility, upgrading the groundwater/leachate collection system components and system controls, and implementing a long-term landfill gas and groundwater monitoring program. This project is ongoing with the PFAS investigative activities continuing through 2023.

*Project Geologist; Environmental Monitoring and Part 115 Compliance, Richfield Landfill, Davison, MI (1996–2011).* Conducted hydrogeologic evaluations, remedial investigations, environmental monitoring and remediation activities at an active non-hazardous waste landfill. Conducted routine environmental monitoring of groundwater, landfill gas, and landfill leachate in accordance with an approved Hydrogeologic Monitoring Program. Also performed groundwater monitoring to demonstrate the effectiveness of a groundwater recovery system and provided subcontractor oversight during the drilling of several soil borings and monitoring wells to facilitate the installation of a hydraulic containment system that included a soil bentonite cut-off wall with a gravity interior drain.

*Task Manager, Project Geologist; Taymouth Landfill, Birch Run, MI (1996-ongoing).* Responsible for routine quarterly environmental **monitoring surveys** and corresponding regulatory reporting at a closed municipal solid waste landfill. Also responsible for **monitoring groundwater, landfill leachate, secondary collection system leachate, landfill gas** concentrations in accordance with approved HMP. Assisted in the development of revised statistical prediction limits for the entire monitoring well network following monitoring well replacement activities.

Task Manager, Assistant Project Manager; Confidential Superfund Client, Willow Boulevard and A-Site Landfills, Kalamazoo, MI (2016 - 2018). Task Manager, Assistant Project Manager, Project Geologist and Field Lead responsible for site's adherence to the approved O&M plan and ensuring that the design features implemented at the site continued providing long-term post remediation preventative care. Responsible for staff resourcing and management, budget tracking, subcontractor oversight, data interpretation and analysis and regulatory reporting. Evaluated landfill gas data to evaluate the effectiveness of the landfill gas management system and to demonstrate that methane migration beyond the property boundaries was not occurring. Evaluated groundwater analytical data and groundwater flow data to demonstrate the effectiveness of the design features in limiting off-site migration of metals and PCBs. Performed landfill inspections to identify the need for repairs and/or maintenance to any of the landfill design components, and/or the restored/mitigated wetland areas at the Operable Unit. Conducted a statistical evaluation and optimization plan to reduce analytical parameters, revise sampling methodologies, and reduce overall operation and maintenance costs at the site. Prepared technical reports for submittal to EGLE and USEPA.

*Task Manager, Assistant Project Manager; Confidential Superfund Client, Kings Highway Landfill, Kalamazoo, MI (2016 - 2018).* Task Manager, Assistant Project Manager, Project Geologist and Field Lead responsible for site's **adherence to the approved O&M plan** and ensuring that the design features implemented at the site continued providing long-term post remediation preventative care. Responsible for staff resourcing and management, budget tracking, subcontractor oversight, and data interpretation and analysis. **Evaluated landfill gas data** to evaluate the effectiveness of the landfill gas management system and to demonstrate that methane migration beyond the property boundaries was not occurring. **Evaluated groundwater analytical data** and groundwater flow data to demonstrate the effectiveness of the design features in limiting off-site migration of metals and PCBs. Performed **landfill inspections** to identify the need for **repairs and/or maintenance** to any of the landfill design components. Prepared technical reports for submittal to EGLE and USEPA.

Task Manager, Assistant Project Manager; Operation and Maintenance and Long-Term Monitoring, Charleston Landfill Charleston Township, MI (2016 – 2018). Responsible for adherence to a Post-Closure Plan and ensuring that the design features implemented at the site continued providing long-term post closure preventative care. Responsible for staff resourcing and management, budget tracking, subcontractor oversight, and data interpretation and analysis. Coordinated and conducted groundwater and leachate monitoring surveys and prepared corresponding regulatory reports for submitted to EGLE. Groundwater and leachate samples were collected in accordance with an approved Hydrogeologic Monitoring Program. Evaluated groundwater analytical data for exceedances of applicable statistical comparison criteria. Performed landfill inspections to identify the need for repairs and/or maintenance to any of the design components and the leachate collection system.

Project Manager, Project Ceologist; ECLE Part 201, Former Schrader & Sons Scrap Metal, Ft. Gratiot Twp., MI (2018 - ongoing). Project Manager in charge of staff and resourcing management, budget tracking, subcontractor oversight, data interpretation and analysis, and reporting at a Part 201 unregulated dump site and former scrap yard. Responsible for staff and resourcing and management, budget tracking, subcontractor oversight, and data interpretation. Specific activities include incremental soil sampling to assess soil direct contact exposures risks, conducting a remedial investigation to investigate metal and PCB impacts to the underlying soil and groundwater, and performing a feasibility study to mitigate direct contact exposures at the site. Recent activities have included developing a remediation plan to eliminate direct contact exposure risks and mitigate potential off-site impacts. Developed design bid specifications and provided oversight of a soil remediation program that resulted in removal of site contaminants from the soil. Implemented a postremediation groundwater monitoring program to assess the effectiveness of remediation activities on the underlying groundwater. This project is ongoing with monitoring well abandonment activities planned for 2023.

Project Manager, Project Geologist; EGLE Part 201, Detroit International Wildlife Refuge, Trenton, MI (2019 – ongoing). Project Manager in charge of staff and resourcing management, budget tracking, subcontractor oversight, data interpretation and analysis, and reporting at a Part 201 formerly Chrysler plant located along the Trenton Channel. Specific activities include reviewing historic environmental reports submitted on behalf of the former owner of the site, investigating groundwater surface water interface impacts to the Trenton Channel/Detroit River, performing a multi-phase geophysical investigation to identify preferred contaminant migration pathways and to search for potential buried drums on the site, drilling and installing groundwater monitoring wells along the shoreline to assess contaminant migration into the surface water body, and assessing potential remedial alternatives to address groundwater impacts to the surface water. This project is ongoing with additional groundwater monitoring and investigation activities planned for 2023.

# Saamih Bashir, PE, PMP, Senior Engineer

Roles/Responsibilities: Project Manager		
Vears of Experience: 22	Education: Msc. Civil Engineering, 2003; Bsc. Civil	
reals of Experience. 22	Engineering, 2000	
	Registrations/Certifications: Professional Engineer - MI,	
Direct Employee, Novi, Michigan	Project Management Professional-1577681; HAZWOPER	
	40 hour	

#### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### **Relevant Experience**

Deputy Project Manager, AFCEC BRAC Midwest BECOS Remedial Action, Former Wurtsmith Air Force Base (AFB); Sub to LCES JV (2021-ongoing). Responsible for project execution, budgeting, and technical reviews. As part of the RA-O and LTM activities, WSP is currently operating, maintaining, and monitoring three groundwater pump and treat systems for PFAS. Treatment technologies include ion exchange resin and granular activated carbon. Provides technical reviews if documents including a Program-wide QAPP and Health and Safety Plan. As Deputy PM responsible for overseeing the daily operation at the treatment facilities, review daily reports, system optimization, budget tracking, subcontractor management, and technically reviewing monthly and annual reports. As deputy PM also responsible for facilitation and support of the local Residential Advisory Board (RAB) meetings as well as the monthly BRAC Contractor Team (BCT) meetings as well as client weekly communication.

Project Manager, Former JB Sims Generating Station-Harbor Island, Grand Haven, MI (2022 – ongoing). Responsible for overall execution and technical reviews. WSP is contracted, under HDR Michigan, Inc, to support the restoration of the former JB Sims Generating Station located in Harbor Island, City of Grand Haven, Michigan. Harbor Island has been used for industrial purposes and waste disposal for over 100 years for city trash (unlined dump site/landfill), dredge materials, and coal ash from JB Sims Plant Units 1 & 2 impoundments among other previous industrial uses. WSP is responsible for the non-Coal Combustion Residuals (CCR) Constituents of Concern investigation, remediation design and implementation to be able to restore the Site into recreational or other use identified by the City of Grand Haven. First step of the project included development of initial Conceptual Site Model (CSM) based on available non-CCR data, identifying data gaps. Data Gap Investigation will include vertical aquifer profiling (VAP) to try to identify the dump site location and PFAS source as well as groundwater flow direction. Based on results from groundwater samples collected from the VAP borings, up to 10 groundwater monitoring wells will be installed, gauged and sampled quarterly for a year as well as surface water samples from surface water bodies located within the site. A remedial investigation will be implemented and a feasibility study will be developed to compare remediation options. Based on funding, remediation will be implemented to support Harbor Island Restoration activities and brownfield redevelopment plans for the property. Project activities also include public communication, coordination with EGLE and Water Resource Department as well as City officials, Michigan Attorney General

office, and elected officials to help secure grants to support project activities.

WSP is also responsible for Engineered **Wetland Treatment system** that treats leachate from a historical, unlined dump landfill/dump site. RA-O activities include sampling groundwater leachate monthly.

Task Lead and Technical Reviewer, Army National Guard (ARNG) Facilities Nationwide (2016-2019). Responsible, technical reviews, budgeting, and overall execution for three sites. As a teaming partner with EA, WSP, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; US Environmental Protection Agency [USEPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations [CFR] Part 300; USEPA, 1994), and in compliance with Army requirements and guidance for field investigations, including specific requirements for sampling for perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), and the group of related compounds known in the industry as **PFAS.** Activities included identifying whether there has been a release to the environment from the Areas of Interest (AOIs) identified in the PA and determine the presence or absence of PFOA, PFOS, and PFBS at or above the 2019 Office of the Secretary of Defense (OSD) screening levels (SLs) (Deputy Assistant Secretary of Defense, 2019), as well as the presence or absence of additional PFAS at the facility. Activities also included preparation of sampling package, presenting the sampling plan to the USACE, ARNG and State ARNG, drafting and submitting SI Work Plans in QAPP format, presenting the work plan to the State regulators and stake holders, collecting PFAS samples from soil and groundwater medias, analyzing the data and completing SI Report with recommendations for either remedial investigation or no further action. As a Task Lead, reviewed sampling plan, presented to the clients, reviewed documentations, and attended meetings with stake holders and regulatory agencies for 3 ARNG installations in IN, KS, and WI.

Deputy Project Manager, EGLE, Muskegon County Airport, Muskegon, Michigan (2019-2022). As a Deputy PM, conducted premilitary assessment at the Muskegon County Airport as a result of downgradient residential drinking water sampling effort showing contamination in residential wells within a mile radius of the airport. As a result, groundwater and soil investigation was conducted at five potential release areas at the airport. First mobilization included collection of soil and groundwater samples using vertical aquifer profiling (VAP). Based on the VAP groundwater samples results groundwater monitoring wells were installed at the highest PFAS locations and were sampled quarterly. The project also involved community relationship, sending letters to residents around the airport soliciting access to sample their residential wells, collecting drinking water samples and coordinating results with EGLE and MDHHS personnel. The project is awarded in phases and pending funding will execute a full delineation remedial investigation at the site and surrounding properties.

*Project Manager, ECLE, Cascade Township, Cascade Township, MI (2019-2022).* Mr. Bashir is the task manager for Cascade Township Residential Well sampling for a **PFAS investigation**. Coordinates private drinking water sampling with EGLE, MDHHS, Kent County Health Department, and Cascade Township, and share analytical results with the private home owners. Performed technical review of work plans. The project involved community relationship, sending letters to residents soliciting access to sample their residential wells, collecting drinking water samples and coordinating results with EGLE and MDHHS personnel.

As a result of the sampling activities Cascade Township was able to secure a \$7.5 million in grants to extend the municipal water line to affected residences.

Project Manager, ECLE, Remedial Investigation for PFAS Former Falk Road Dump, Holly, MI (2022-ongoing). Responsible for project execution, budgeting, and technical reviews.WSP is contracted by EGLE for continued remedial investigation and other response activities necessary to address existing or imminent unacceptable risks arising from a release at a former municipal dump and Part 201 Facility known as the Former Falk Road Dump. WSP reviewed available historical files as provided by EGLE and then conducted **baseline sampling** to existing groundwater monitoring, collected synoptic water level elevation measurements, and surveyed existing wells to understand the local groundwater flow direction to develop the initial conceptual site model (CSM). WSP then completed 6 Vertical Aquifer Profiling (VAP) sampling at the location where groundwater samples showed high concentrations of PFAS to try to understand the vertical distribution of the PFAS contamination. WSP collected soil, surface water and sediment samples during the initial RI investigation. WSP also analysed some of the soil samples for total organic carbon, pH, and grain size analysis (hydrometer method) to support the evaluation of PFAS fate and transport. The CSM will be used to identify Site-specific data to support fate and transport modeling generation and will provide a basis for the modeling lead to evaluate and recommend a groundwater fate and transport model for use at the Site. The CSM will be used in conjunction with the preliminary fate and transport assessment to identify potential data gaps for future investigation of potential exposure pathways (e.g., volatilization to indoor air pathway).

*Project Manager, ECLE, Remedial Investigation for PFAS Misak Landfill- Wayland, Michigan (2022-ongoing).* Responsible for project execution, budgeting, and technical reviews. WSP is contracted by EGLE to conduct **PFAS investigation activities** to understand concentrations of PFAS in groundwater and to estimate groundwater flow direction because the extent of the PFAS groundwater impact has not been fully defined and additional drinking water and surface water receptors may be at risk. WSP coordinated with property owners to collect samples from up to eight (8) existing groundwater monitoring wells to evaluate the presence or absence of PFAS within groundwater. Two (2) VAP borings will be advanced to a depth of at most 150 ft bgs. The VAP borings will be advanced using **sonic drilling** techniques. At each VAP boring, a groundwater sample will be collected from the top of the aquifer and then every 10 feet thereafter. Contingent on the results of the samples collected from the initial VAP borings, up to three (3) additional VAP borings will be advanced under a separate mobilization. Based on VAP boring sampling, up to two permanent monitoring wells will be installed.

# Megan Cynar, Senior Environmental Scientist

Roles/Responsibilities: Project Manager				
Years of Experience: 17	Education: BS, Environmental Studies			
Direct Employee, Novi, MI	<b>Registrations/Certifications:</b> 2019, Certified Hazardous Materials Mgr.; 2022, Asbestos Building Inspector			

#### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

#### Project Manager; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010 -

ongoing). Responsible for scope, schedule, budget, client communications, and deliverables. Previously provided task management responsibilities including coordinating staff, overseeing field activities, evaluation and tabulation of data, and technical reporting. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and insitu chemical oxidation (ISCO) bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A regulated materials survey, geotechnical investigation, and waste characterization sampling were completed, and multiple monitoring wells were abandoned in preparation for the full-scale soil excavation work. WSP will provide construction oversight for EGLE during the full-scale soil excavation.

Senior Environmental Scientist; ECLE Part 201, Marshall Iron and Metal, Marshall, MI (2015ongoing). Responsibilities include drafting technical documents. WSP conducted an investigation which included laser induced fluorescence (LIF) to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP prepared design bid documents for soil excavation and removal of NAPL, transportation, disposal to an approved landfill, backfill, and site restoration. WSP assisted EGLE in procuring a trade contractor and provided construction oversight during construction activities. WSP collected verification samples for laboratory analyses. Upon completion of the excavation activities, WSP prepared a construction report summarizing the activities. WSP completed an offsite investigation and determined NAPL extended to the adjacent property. WSP developed a feasibility study which recommended an in-situ enhanced bio-remediation remedy using BOS®200 to remediate the offsite property. WSP conducted a pilot study, developed bis specifications, and assisted EGLE with contractor procurement. WSP conducted contractor oversight of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP conducted **soil gas survey** of the offsite building. WSP installed soil vapor pins in the building. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Senior Environmental Scientist; EGLE Part 201, Broadway Coin Laundry, Ann Arbor, MI (2017 -ongoing). Responsibilities included obtaining appropriate permitting and technical reviews. Supporting brownfield redevelopment of this former dry cleaner property. Designed and implemented a series of geophysical profiles (resistivity/IP profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. Geophysical results used to focus downgradient vertical aquifer sampling (VAS) locations. Coordinated project team throughout remedial investigation to assess tetrachloroethylene (PCE) impacts to soil, soil gas and groundwater beneath and downgradient of the site. Obtained property access and soil permits for on- and offsite sampling. To assess GSI risk, contaminant fate and transport was assessed for possible migration into nearby water bodies (Taver Creek and Huron River) and the shallow and deep groundwater systems. VAS borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Organized field efforts to redevelop existing groundwater monitoring wells, install additional monitoring wells using **sonic drilling**, and sample the wells to further analyze the contamination extent. Conducted pilot testing using **PlumeStop™**. Conducted engineering evaluations and oversight of **pilot testing** being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess performance of the pilot study and evaluate potential additional downgradient investigation and remediation.

Senior Environmental Scientist; ECLE Part 201, Telecraft Shopping Center, Redford, MI (2017 - ongoing). Responsibilities include organizing field activities and providing technical reviews. WSP reviewed project deliverables and developed project approaches. WSP conducted a soil, groundwater, and soil gas investigation of a tetrachloroethylene (PCE) plume associated with a former dry cleaner, which extends beneath a residential apartment complex, located immediately downgradient of the Site. Additionally, the Rouge River is located approximately 1,000-feet downgradient of the Site. To assess GSI risk, contaminant fate and transport was assessed for possible migration to the Rouge River. Evaluation of the vapor intrusion pathway related to shallow groundwater on the adjacent residential apartment complex is ongoing, as well as quarterly groundwater and soil vapor sampling. Additional assessment of the soil vapor pathway was conducted at the apartment complex by completing vapor sampling and a camera survey within the sewer lines. Soil, groundwater, and soil vapor data collected is currently being evaluated by the project team for use in preparation of a focused feasibility study.

Senior Environmental Scientist; EGLE Part 201, Hensley Property, Marshall, MI (2017 - ongoing). Responsible for providing technical reviews for this brownfield redevelopment

project and overall execution by WSP staff. WSP conducted a limited **investigation** which included use of **LIF** to determine the extent of **NAPL**, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP developed a **feasibility study** which recommended an In-situ enhanced bio-remediation remedy using BOS®200 to remediate the property. WSP conducted a **pilot study**, developed **design bid specifications**, and assisted EGLE with contractor procurement. WSP conducted **contractor oversight** of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP completed a **vapor intrusion** investigation by installing soil vapor points and collecting soil gas samples. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Senior Environmental Scientist; EGLE Part 201, Michner Plating, Jackson, MI (2018 – ongoing). Responsibilities include scheduling of field tasks, data tabulation, and drafting of technical reports. Scope involves conducting Phase I &II Environmental Site Assessments, and a **Regulated Material Survey (RMS)**. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical- and petroleum-stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of **PFAS.** As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the installation of two vapor mitigation systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

Senior Environmental Scientist; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 - ongoing). Responsibilities include assisting with procurement activities and drafting technical reports. WSP reviewed project deliverables and developed of project approaches in support of **brownfield redevelopment**. WSP completed an **RMS** as part of the pre-design investigation. The **RMS** included **asbestos**, **lead-based paint sampling**, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed **design specifications for site remediation** that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

Task Manager; ECLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 - ongoing). Responsibilities include coordinating staff, scheduling, oversight of field activities, communicating with the project manager on field activities, and drafting and reviewing technical reports. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Site CSM and conducted a subsequent data gap investigation to support remedial design, PRB performance monitoring plan and VIAP assessment work plan to address residual hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a focused feasibility study to address the residual source and provided stakeholder outreach support and PRB operation, monitoring, and maintenance (OM&M) in support of EGLE. WSP developed design bid specifications for the demolition of the Site building, which was funded through a Brownfield Redevelopment Grant. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted **construction oversight** during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP is currently completing a **bench study** to determine amendment mix ratios needed to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the insitu remediation of soil and groundwater which may also include excavation.

# Michael McGowan, PE, Senior Engineer

Roles/Responsibilities: Project Manager; Engineering, Construction Oversight, O&M				
Years of Experience: 30	Education: BS, Eng. Environmental Engineering, 1992,			
Direct Employee Novi MI	Registrations/Certifications: Professional Engineer, MI,			
Direct Employee, Novi, Mi	2001; OSHA 40-hour HAZWOPER Hazardous Materials			

#### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

Project Engineer; Confidential Client, Detroit Refinery, Detroit, MI (2002 - ongoing). Part of the team responsible for development of the remedial bid specifications. Environmental services to design and implement response measures to mitigate a 12-acre former coal tar refinery site with free product, groundwater, and soil contamination from coal tar refining wastes (VOCs, SVOCs, metals, and NAPL) migrating toward the Rouge River. Conducted extensive upland investigation, including the use of a laser induced fluorescence (LIF) technology (TarCost®). Conducted a regulated materials survey (RMS) and lead-based paint sampling in preparation for building demolition. Developed a remedial design to mitigate contaminated groundwater migration to the Rouge River. Developed specifications for demolition of a one million gallon above ground storage tank (AST) and disposal of hazardous waste. Designed the reconfiguration of site utilities (power, water, and gas), conducted a vapor intrusion study and abandoned monitoring wells in preparation for brownfield redevelopment. WSP provided construction oversight during construction of the groundwater capture and treatment system, building and AST demolition and utility reconfiguration. WSP is providing operation and maintenance of the groundwater capture and treatment system.

Project Manager/Engineer; EGLE Part 201, Harbor Plating Facility, Benton Harbor, MI (2005 – ongoing). Responsible for scope, schedule, budget, design specifications, and construction management of all work at an abandoned chrome and cadmium plating facility. Various soil and groundwater investigations were conducted and determined that a 1,600-foot-long chromium- and TCE-contaminated groundwater plume emanated from this former plating facility and was discharging to nearby creeks. The chromium contamination was determined to be both a RCRA Listed and Characteristically hazardous waste by the USEPA and EGLE. A feasibility study showed the best remedial alternative to protect the creeks was groundwater capture and treatment using an iron co-precipitation process to remove the chromium, followed by a granulated activated carbon polish. A remedial design of the system was completed, and the system was constructed with WSP providing construction oversight. The specifications included soil erosion and sedimentation controls, repairs/modifications of an existing building to house the treatment system, a Unipure™ treatment system, and groundwater collection trenches with pneumatic pumps, directional drilling of water transport pipes and air lines for the pumps, and site restoration. Since system construction, WSP has been providing system operation and maintenance. Conducted a groundwater PFAS investigation to characterize site groundwater.

*Project Engineer; EGLE Part 201 Wickes Manufacturing 5-Mile-Long TCE Plume; Mancelona, MI (2007 - ongoing).* Responsible for development of the **sonic drilling** specifications at a total value over \$3.2 million. The project scope also included conducting investigation [vertical aquifer sampling, **geophysical surveys** (seismic profiling, induced polarity and electrical resistivity, and down hole gamma logging) multiple drilling methods for deep monitoring well installations], community relations for TCE plume extending 5 miles from source area, affecting more than 1,200 properties. To date, 17 **monitoring wells have been abandoned**. Developed and support an interactive web-based GIS web page for displaying project details. Conducted **feasibility study** to evaluate in-situ technologies including in-situ chemical oxidation (ISCO) and enhanced in-situ bioremediation. Monitored natural attenuation approach is currently being taken due to technical constraints.

Project Engineer; ECLE Part 201 Cal's Car Care, Northville, MI (2008 - ongoing). Project recognized as a redevelopment "Success Story" by the EGLE. Part of the team responsible for the development of the focused feasibility study. WSP designed and directed a multi-phase groundwater, soil, soil gas, and indoor air remedial investigation involving commingled releases from leaking underground petroleum storage tanks and a former dry-cleaning business. Identified onsite source areas using passive soil vapor sampling. Planned and implemented multi-phased vapor intrusion assessments at neighboring properties, including the City's municipal offices plus several commercial and residential properties. Assessments involved comparison of groundwater samples to rapidly evolving vapor intrusion screening levels, installation of exterior soil gas monitoring points, analysis of sub-slab soil gas, and indoor air sampling. Coordinated field sampling with brownfield redevelopment activities. Investigation results used by developer to include passive vapor mitigation system (VMS) in construction plans. When post-installation indoor air samples showed passive VMS not performing as intended, conducted a focused feasibility study to evaluate potential VMS options. WSP designed recommended modifications, provided construction oversight of the improvements, and conducted performance monitoring to evaluate effectiveness.

Principal Engineer; MDNR Part 201 Former Rose Lake Shooting Range, Bath, MI (2009–2019). Responsible for site strategy development with project team. Assisted in development of project scope to characterize the extent of lead contamination at a former skeet/trap shooting range located within a State Game Area that has a wide and deep lead shot pattern and overlaps over 5 acres of wetlands. During the **remedial investigation**, assisted the selection of decision units for multi-incremental sampling investigation, completed sampling, and completed lead stabilization treatability study. Approximately 80 samples were collected from down range areas and analyzed for total lead, and a limited number of samples for TCLP lead. The extent of lead impacted soils was defined using generic Part 201 cleanup criteria. Most of the shot fall zone lies within a scrub/shrub wetland. Site ecological and human health risks to lead exposure are being evaluated using site specific information. A Baseline Ecological Risk Study was conducted to assess the lead exposure to small mammals, invertebrates, and the overall effect on the food chain. For the **feasibility study**, completed a technology evaluation for 11.5 acres that were selected based on multi-incremental sampling results. Based on site specific ecological based screening levels, minimized remedial footprint using multi-incremental sampling methods, prepared cost estimates, evaluated technologies for a variety of general remedial responses (e.g., containment, in-situ stabilization, and removal solutions), and conducted several regulatory meetings with MDNR and EGLE wetland permitting officers to select a soil relocation option where impacted soils would potentially be reused for berms at a

200-yard-long shooting range if soils are rendered non-hazardous. Soil relocation option is expected to significantly reduce otherwise expensive disposal costs and dramatically increase sustainability options for similar impacted skeet ranges undergoing remedial evaluations.

Senior Engineer; Confidential Client, Lower Rouge River-Old Channel, Detroit, MI (2010 – ongoing). Part of the team responsible for development of remedial investigation/feasibility study (RI/FS). Scope of work includes sediment and porewater sampling, hydrographic surveys, and use of LIF technologies (TarGost®, UVOST®) to identify possible upland sources and potential in river sources consisting of free product to support river restoration efforts. In support of SOW development, managed and reviewed results from historic property uses to identify possible sources and specify sample locations and approaches. Responsible for public outreach program including briefings for EPA-GLNPO, the City of Detroit, the Economic Development Corp., EGLE, and local businesses. A remedial design was completed by WSP, followed by construction oversight of riverbank restoration work.

Project Manager/Engineer; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010 – ongoing). Responsible for scope, schedule, budget, design specifications, and construction management of all work. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and ISCO bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of Enviroblend<sup>™</sup> to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. An RMS, geotechnical investigation, and waste characterization sampling were completed, and multiple monitoring wells were abandoned in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

Senior Project Engineer: EGLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2015– ongoing). Senior Engineer responsible for reviewed the feasibility study for this phased remedial investigation that included electromagnetics (EM-31), ground penetrating radar (GPR) and down hole gamma logging, direct push, test pitting, pore water, storm water and surface water sample collection. RI activities included delineation of metals-related impacts in soil and groundwater using sonic drilling methods and assessment of migration into and along historic tannery and municipal storm water utility infrastructure. Constructed Conceptual Site Model (CSM) for use in a focused feasibility study to address metals and buried hides at the Site, which were subsequently excavated as part of two IRMs. Worked with WSP and EGLE toxicologists to develop site-specific criteria for lead and arsenic using results from an in-vivo bioavailability assessment (IVBA). PFAS were identified in Site soil and groundwater. WSP characterized PFAS in soil, groundwater, and surface water, collected additional data to support CSM development and implemented PFAS immobilization bench **top and pilot scale studies** at the Site. Pilot test studies performed at the Site included: direct push injection and soil mixing of biochar into the formation to reduce PFAS concentrations/migration in groundwater and to reduce infiltration into the submerged, impacted storm water infrastructure; emplacement of biochar mitigation materials into historical storm water infrastructure to mitigate direct migration of PFAS to the Thunder Bay River and recent studies to assess microbially enhanced transformation and/or destruction of PFAS using endemic microbes. WSP provided oversight of **well abandonment** and completed a **remedial design**, followed by **construction oversight** of a focused paved "cap" to reduce leaching to groundwater from vadose soil and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors.

Project Manager and Construction Manager; EGLE Part 201, Marshall Iron and Metal, Marshall, MI (2015 - ongoing). Responsible for all aspects of the project. WSP conducted an investigation which included LIF to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP prepared design bid documents for soil excavation and removal of NAPL, transportation, disposal to an approved landfill, backfill, and site restoration. WSP assisted EGLE in procuring a trade contractor and provided construction oversight during construction activities. WSP collected verification samples for laboratory analyses. Upon completion of the excavation activities, WSP prepared a construction report summarizing the activities. WSP completed an offsite investigation and determined NAPL extended to the adjacent property. WSP developed a feasibility study which recommended an in-situ enhanced bioremediation remedy using BOS®200 to remediate the offsite property. WSP conducted a **pilot study**, developed bis specifications, and assisted EGLE with contractor procurement. WSP conducted contractor oversight of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP conducted **soil gas survey** of the offsite building. WSP installed soil vapor pins in the building. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

*Project Manager and Construction Manager; ECLE Part 201, Hensley Property, Marshall, MI (2017 - ongoing).* Responsible for all aspects of this **brownfield redevelopment** project and overall execution by WSP staff. WSP conducted a limited **investigation** which included use of **LIF** to determine the extent of **NAPL**, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP developed a **feasibility study** which recommended an In-situ enhanced bioremediation remedy using BOS®200 to remediate the property. WSP conducted a **pilot study**, developed **design bid specifications**, and assisted EGLE with contractor procurement. WSP conducted **contractor oversight** of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP completed a **vapor intrusion** investigation by installing soil vapor points and collecting soil gas samples. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

*Construction Manager; EGLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 - ongoing).* Responsible for the development the bid specifications, assisting with Trade Contractor procurement, and management the construction activities during the remedial action. A condominium complex consisting of 10 buildings was developed as a **brownfield project** over this unlicensed former landfill. There have been occurrences of **free product** in some of the building basement sumps and odors described as oil or solvent odors, and sub-slab vapor extraction systems were installed. WSP was hired to conduct an **investigation** of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, **install and sample sub slab vapor pins** and inspect and seal cracks and joints in the basements. WSP also inspected the adjacent stormwater sewer system using **sewer cameras** to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the **sewer was cleaned by jetting**. WSP then developed **design specifications** for **dredging the detention basin** to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided **construction oversight** of the contractor on behalf of EGLE.

Project Manager/Engineer; EGLE Part 201, Fort Gratiot Landfill, Landfill Cover System Design, Port Huron, MI (2018 - ongoing). Responsible for scope, schedule, budget, and design specifications at a 19-acre Part 201 landfill. Provided final review of design and construction oversight of a dual composite geosynthetic final cover system for the landfill, a leachate control system consisting of a leachate and groundwater interceptor trench, a passive landfill gas venting system, storm water management facilities, SESC controls, and the construction of islands within the existing pond and wetlands to create habitats for migratory birds. Also responsible for the successful removal of a 10,000-gallon UST, culvert replacement, ditch construction, and weir construction to restore the onsite pond and to mitigate flooding of the surrounding adjacent properties, implementation of an onsite and offsite PFAS surface water and groundwater investigations, assessing feasible alternatives for treating PFAS in the groundwater and leachate generated at the facility, upgrading the groundwater/leachate collection system components and system controls, and implementing a long-term landfill gas and groundwater monitoring program. Provided review during construction of the remedies, reviewing shop drawings, survey data, test results, and directed walkover inspections for substantial completion. Program Manager for the Fort Gratiot Landfill O&M program which includes maintenance of the landfill cover system, landfill gas venting system, groundwater/leachate collection and pumping system, and storm water facilities at the site.

Project Manager; EGLE Part 201, Michner Plating, Jackson, MI (2018 - ongoing). Responsible for all aspects of the project for this former plating facility adjacent to the Grand River. Scope involves conducting Phase I &II Environmental Site Assessments, and an RMS. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical and petroleum-stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of **PFAS.** As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor

sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the **installation of two vapor mitigation** systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

Senior Design Engineer and Construction Manager; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 - ongoing). Responsible for the development the bid specifications, assisting with Trade Contractor procurement, and management the construction activities during the remedial action. WSP reviewed project deliverables and developed of project approaches in support of **brownfield redevelopment**. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

Senior Project Engineer; ECLE Part 201, 17627 Conant Street, Detroit, MI (2019-ongoing). Responsible for development of the bid specifications and assisted EGLE during the trade contractor procurement and site remediation activities. WSP implemented and conducted/managed the building demolition and a site-wide subsurface soil and groundwater investigation in support of brownfield redevelopment. Scope of work included historical records review, asbestos inspection, lead-based paint sampling, and an RMS and preparation of a characteristically hazardous building materials evaluation. WSP developed design bid specifications for building demolition. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. WSP is currently completing the construction documentation report.

#### Construction Manager; ECLE Part 201, 6598 Helen Street, Detroit, MI (2020 - ongoing).

Responsible for the development the bid specifications, assisting with Trade Contractor procurement, and management the construction activities during the remedial action. This **brownfield redevelopment** project began as an **RI** of soil and groundwater at this former gas station. WSP conducted an **RMS**. The survey included **asbestos**, **lead-based paint**, and stained concrete sampling. Based on the results of the RI and RMS, WSP developed **design bid specifications** to demolish the building, **remove the USTs**, and **excavate impacted soil**. WSP assisted with Trade Contractor procurement and provided **oversight** of the construction activities consisting of UST removal, soil excavation and building demolition.

Project Manager; EGLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 - ongoing). Responsible for all aspects of the project. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Site CSM and conducted a subsequent data gap investigation to support remedial design, PRB performance monitoring plan and VIAP assessment work plan to address residual hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a **focused feasibility study** to address the residual source and provided stakeholder outreach support and PRB operation, monitoring, and maintenance in support of EGLE. WSP developed design bid specifications for the demolition of the Site building, which was funded through a Brownfield Redevelopment Grant. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted construction oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP is currently completing a bench study to determine amendment mix ratios needed to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the in-situ remediation of soil and groundwater which may also include excavation.

*Project Engineer; Confidential Client, Mishawaka, IN (2011-2013).* Responsible for the development the bid specifications and assisting with Trade Contractor procurement for the demolition of an 82,000 square foot facility formerly used in the testing and manufacture of guided missiles. Work consisted of pre-demolition RMS that included **an asbestos survey, lead-based paint sampling**, testing of potential hazardous materials and **radiological screening**. WSP developed **design demolition specifications** and procurement plans. Under **construction oversight** by WSP, the building structures were razed to the ground surface, and materials were recycled or disposed according to the specifications.

# Steven Murray, CGP, Senior Geologist

Roles/Responsibilities: Project Manager; Environmental Investigation		
Years of Experience: 37	Education: BS, Geology, 1985	
Direct Employee, Traverse City, MI	<b>Registrations/Certifications:</b> Certified Geologist, US, earned 1999, #10542, OSHA 40-hour HAZWOPER Hazardous Materials	

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### **Relevant Experience**

Sr. Project Manager; EGLE Part 201 Wickes Manufacturing 5-Mile-Long TCE Plume; Mancelona, MI (2007 - ongoing). Responsible for project implementation of investigations and results using **sonic drilling** to depths of up to 586 feet at a total value over \$3.2 million. The project scope also included conducting investigation [vertical aquifer sampling, geophysical surveys (seismic profiling, induced polarity and electrical resistivity, and down hole gamma logging) multiple drilling methods for deep monitoring well installations], community relations for TCE plume extending 5 miles from source area, affecting more than 1,200 properties. Assess GSI risk, contaminant fate and transport assessed for possible migration into nearby water bodies (Shanty Creek and Cedar River). Annual porewater and surface water sampling is part of Site monitoring program to document conditions where impacted groundwater is entering surface water. **VIAP assessments** were performed where VOCs are present at the water table near source Site in Mancelona and down gradient along plume transect. WSP designed and installed of SSDSs. Vapor intrusion mitigations systems were designed and install under three commercial buildings in Mancelona to render vapor intrusion pathway incomplete. To date, 17 monitoring wells have been abandoned. Developed and support an interactive web-based GIS web page for displaying project details. Conducted feasibility study to evaluate in-situ technologies including in-situ chemical oxidation (ISCO) and enhanced in-situ bioremediation. Monitored natural attenuation approach is currently being taken due to technical constraints.

Technical Leader; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010 –

ongoing). Responsible for providing technical guidance for ISCO bench and **pilot studies** to mitigated VOCs in groundwater. The project tasks also included the development of **design specifications** and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A **regulated materials survey, geotechnical investigation**, and **waste characterization sampling** were completed, and multiple **monitoring wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

*Sr. Project Manager/Technical Reviewer; EGLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2015 - ongoing).* Project Manager for design and implementation of a phased **remedial investigation** that included **electromagnetics (EM-31), ground penetrating radar** and down hole **gamma logging**, direct push, test pitting, pore water, storm water and surface water sample collection. RI activities included delineation of metals-related impacts in soil and groundwater using direct push drilling methods and assessment of migration into and along
historic tannery and municipal storm water utility infrastructure. Constructed conceptual site model (CSM) for use in a focused **feasibility study** to address metals and buried hides at the Site, which were subsequently excavated as part of two IRMs. Worked with WSP and EGLE toxicologists to develop site-specific criteria for lead and arsenic using results from an in-vivo bioavailability assessment. PFAS were identified in Site soil and groundwater. WSP characterized PFAS in soil, groundwater, and surface water, collected additional data to support CSM development and implemented PFAS immobilization bench top and pilot scale studies at the Site. Pilot test studies performed at the Site included: direct push injection and soil mixing of biochar into the formation to reduce PFAS concentrations and migration in groundwater and to reduce infiltration into the submerged, impacted storm water infrastructure; emplacement of biochar mitigation materials into historical storm water infrastructure to mitigate direct migration of PFAS to the Thunder Bay River and recent studies to assess microbially enhanced transformation and/or destruction of PFAS using endemic microbes. WSP provided oversight of well abandonment and completed a remedial design, followed by construction oversight of a focused paved "cap" to reduce leaching to groundwater and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors.

*Technical Leader; Confidential Client, Chemical Production, Storage and Packaging Facility; Danville, IL (2017 - ongoing).* Provided technical review for development of CSM in support of **feasibility study** and subsequent **remedial design** for remedy to remove **free product** from the source area and control residual carbon tetrachloride contamination in groundwater. Selected remedy was electrical resistive heating (ERH). Developed remedial design, drawings, and bid package. Provided **construction oversight**, including review of contractor submittals. Worked with the primary ERH contractor, hazardous waste contractor, and other lower tier subcontractors to coordinate and facilitate the success of the project. This project was developed in accordance with an Indiana EPA approved RAP for the **mass reduction of approximately 225,000 pounds** of carbon tetrachloride, and other chemicals, across approximately one acre to a depth of up to 31 feet at this active chemical facility. The RRH system utilized ERH collocated with vertical SVE wells with additional horizontal SVE network, all overlain with an insulative vapor barrier. **VIAP assessments** and **installation of SSDSs**. Vapor intrusion mitigations systems were designed and install under three site buildings to render vapor intrusion pathway incomplete.

*Sr. Associate Geologist/Technical Reviewer; EGLE Part 201, Broadway Coin Laundry, Ann Arbor, MI (2017 - ongoing).* Supporting **brownfield redevelopment** of this former dry cleaner property. Designed and implemented a series of **geophysical profiles** (resistivity/IP profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. Geophysical results used to focus downgradient vertical aquifer sampling (VAS) locations. Coordinated project team throughout **remedial investigation** to assess tetrachloroethylene (PCE) impacts to soil, **soil gas** and groundwater beneath and downgradient of the site. Obtained property access and soil permits for on- and offsite sampling. To assess CSI risk, contaminant fate and transport was assessed for possible migration into nearby **water bodies** (Traver Creek and Huron River) and the shallow and deep groundwater systems. VAS borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Organized field efforts to redevelop existing groundwater monitoring wells, install additional monitoring wells using sonic drilling, and sample the wells to further analyze the contamination extent. Conducted pilot testing using PlumeStop<sup>™</sup>. Conducted engineering evaluations and oversight of pilot testing being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess performance of the pilot study and evaluate potential additional downgradient investigation and remediation.

*Sr. Associate Geologist/Project Manager; ECLE Part 201/CERCLA, Tar Lake Superfund Site, Mancelona, MI (1998-Ongoing).* Groundwater Monitoring and BioSparge System Operation, Mancelona, MI. Mr. Murray provided **construction oversite** during system construction and assists EGLE with operation and optimization of a 22 well biosparge system. The system is designed to maintain aerobic conditions in the upper 30 feet of the water table aquifer along a 700 foot long transect. With the presence of dissolved oxygen existing micros break down aromatic hydrocarbons as impacted groundwater flows down gradient away from former source area. Biosparge system operations reduce aromatic hydrocarbon concentrations below the MCL. WSP has performed sparge **well abandonment** and replacement and performed **supplemental investigations** of groundwater to evaluate treatment extent by operating system for optimization purposes. Also, Mr. Murray acted as construction/safety manager during excavation of creosote impacted soils during municipal water line installation adjacent to the site. Mr. Murray provides project management and technical support to the EGLE for BioSparge **system operation, maintenance, performance monitoring** and optimization.

*Sr. Project Manager; Confidential Client, Mishawaka, IN (2011-2013).* Demolition of an 82,000square foot facility formerly used in the testing and manufacture of guided missiles. Work consisted of pre-demolition **Regulated Materials Surveys** that included **an asbestos survey**, **lead-based paint sampling**, testing of potential hazardous materials in multiple **above ground storage tanks (ASTs)** and **radiological screening**. WSP developed **design demolition specifications** and procurement plans. Under **construction oversight** by WSP, the building structures were razed to the ground surface and materials from the ASTs were disposed and the ASTs were recycled according to the specifications.

Sr. Associate Geologist/Project Manager; EGLE Part 201/CERCLA, Wash King Laundry Superfund Site, Groundwater Monitoring and Groundwater Pump and Treat System Operations, Baldwin, MI (2017-Ongoing). Mr. Murray overseeing operation, maintenance and performance monitoring of groundwater pump and treat system which currently consist of five groundwater extraction wells. Average groundwater extraction rate is 290 gallons per minute. Groundwater treatment is completed by a parallel set of coarse bubble air strippers. Post treatment the groundwater is transferred to infiltration basin. Project activities include weekly site inspections and management of other scheduled maintenance and **repair activities** to keep system operating within design specifications under EGLE Lead CERCLA Program. System is designed to control groundwater plume from reaching Peer Marquette River. WSP performs system performance and groundwater monitoring program for the Site. In addition to chlorinated VOCs, **PFAS** has been detected in groundwater on portions of the Site and is incorporated in the semi-annual groundwater monitoring program. WSP is developing plans to implement pre-design **investigations** of Operable Unit-2 Source Area Abatements (using **Sonic Drilling**) and for replacement of community water system Class I wells and pump house.

*Sr. Associate Geologist/Project Manager; EGLE, Former Zephyr Naph-Sol Refinery Superfund Site, Muskegon, MI (2017-2022).* Mr. Murray assisted EGLE with development of contracting specifications for installation of injection/extraction array and performance monitoring wells across the 23-acres at the Site over three phases implementation. The trade contract is to assist WSP with injection well array installations and abandonment, mixing and injection of catalyzed (sodium hydroxide) sodium persulfate solution in conjunction with vacuum extraction with vacuum (VAC) truck. The treatment chemistry is designed to decrease the viscosity of the **free product** and mobilize it for recovery by VAC truck. Extracted liquid were temporary stored on-site in fraction tanks and transported offsite for product separation and recovery. A total of 1,842 wells were installed across the 23-acre abatement areas to facilitate ISCO injection/extraction program. After program was completed 1,699 wells were abandoned.

# Nick Rogers, Senior Geologist

Roles/Responsibilities: Project Manager, Environmental Investigation, O&M	
Years of Experience: 21	Education: BS, Geology, 1998
Direct Employee, Novi, MI	Registrations/Certifications: OH VAP CP, 2017 #373

### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

### Field Geologist; Confidential Client, Detroit Refinery, Detroit, MI (2002 - ongoing).

Responsible for contractor management of drilling contractors. Environmental services to design and implement response measures to mitigate a 12-acre former coal tar refinery site with **free product**, groundwater and soil contamination from coal tar refining wastes (VOCs, SVOCs, metals, and NAPL) migrating toward the Rouge River. Conducted extensive upland investigation, including the use of a **laser induced fluorescence (LIF)** technology (*TarCost®*). Conducted a **regulated materials survey (RMS)** and **lead-based paint sampling** in preparation for building demolition. Developed a **remedial design** to mitigate contaminated groundwater migration to the Rouge River. Developed specifications for demolition of a **one-million-gallon above ground storage tank (AST)** and disposal of hazardous waste. Designed the **reconfiguration of site utilities** (power, water, and gas), conducted a **vapor intrusion study** and **abandoned monitoring wells** in preparation for brownfield redevelopment. WSP provided **construction oversight** during construction of the groundwater capture and treatment system, building and AST demolition and utility reconfiguration. WSP is providing **operation and maintenance** of the groundwater capture and treatment system.

Senior Geologist; Confidential Client, Lower Rouge River–Old Channel, Detroit, MI (2010– ongoing). Responsible for contractor procurement, management, during the installation of three turbidity rental buoys in the Lower Rouge River. Scope of work includes sediment and porewater sampling, hydrographic surveys, and use of LIF technologies (TarGost®, UVOST®) to identify possible upland sources and potential in river sources consisting of **free product** to support **river restoration** efforts. In support of SOW development, managed and reviewed results from historic property uses to identify possible sources and specify sample locations and approaches. Responsible for public outreach program including briefings for EPA-GLNPO, the City of Detroit, the Economic Development Corp., EGLE, and local businesses. Mr. Bondy provided strategic direction and principal review of the feasibility study. A remedial design was completed by WSP, followed by **construction oversight** of riverbank restoration work.

Senior Geologist; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010– ongoing). Responsible for contractor management and task management. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and insitu chemical oxidation (ISCO) bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of **design specifications** and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. An **RMS**, **geotechnical investigation**, and **waste characterization sampling** were completed, and multiple monitoring **wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

Senior Geologist; Confidential Client, Kalamazoo River Superfund Site, MI (2013 – ongoing).

As Senior Geologist responsible leading teams during the **remedial investigations** and for the installation of stilling well and transducers in the River. Primary contaminant is PCBs in sediment and floodplain soil. Investigation work includes hydrographic surveys, sediment and soil sampling, fish collection and tissue analysis, geotechnical investigation and the **evaluation of remedial alternatives** involving dredging sediment capping and natural recovery. Working with **risk assessors** and statisticians within WSP, USEPA and EGLE (and their consultants) to evaluate **river ecosystem restoration**, including decreasing PCB concentrations in fish tissue. WSP completed two **remedial designs** for two sub-reaches of the river, followed by **construction oversight** during removal of a dam water control structure, sediment dredging and **wetland restoration**.

Project Manager; EGLE Part 201, Broadway Coin Laundry, Ann Arbor, MI (2017 - ongoing). Responsible for leading team and directing of installation of monitoring wells, soil vapor points and pilot studies. Supporting brownfield redevelopment of this former dry cleaner property. Designed and implemented a series of geophysical profiles (resistivity/IP profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. Geophysical results used to focus downgradient vertical aquifer sampling (VAS) locations. Coordinated project team throughout remedial investigation to assess tetrachloroethylene (PCE) impacts to soil, soil gas and groundwater beneath and downgradient of the site. Obtained property access and soil permits for on- and offsite sampling. To assess GSI risk, contaminant fate and transport was assessed for possible migration into nearby water bodies (Taver Creek and Huron River) and the shallow and deep groundwater systems. VAS borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Organized field efforts to redevelop existing groundwater monitoring wells, install additional monitoring wells using **sonic drilling**, and sample the wells to further analyze the contamination extent. Conducted pilot testing using **PlumeStop™**. Conducted engineering evaluations and oversight of **pilot testing** being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess

performance of the pilot study and evaluate potential additional downgradient investigation and remediation.

*Project Manager; EGLE Part 201, Telecraft Shopping Center, Redford, MI (2017 – ongoing).* Responsible for leading team and directing of installation of monitoring wells, soil vapor points and project delivery by WSP staff. WSP conducted a soil, groundwater, and **soil gas investigation** of a tetrachloroethylene (PCE) plume associated with a former dry cleaner, which extends beneath a residential apartment complex, located immediately downgradient of the Site. The Rouge River is located approximately 1,000-feet downgradient of the Site. To assess GSI risk, contaminant fate and transport was assessed for possible migration to the Rouge River. **GPR** was used to locate underground utilities in preparation for the investigation. Evaluation of the vapor intrusion pathway related to shallow groundwater on the adjacent residential apartment complex is ongoing, as well as quarterly groundwater and soil vapor sampling. Additional assessment of the soil vapor pathway was conducted at the apartment complex by completing vapor sampling and a **camera survey within the sewer lines.** Soil, groundwater, and soil vapor data collected is currently being evaluated by the project team for use in preparation of a focused feasibility study.

Task Manager; ECLE Part 201, Cudith Road Landfill, Woodhaven, MI (2017 – ongoing).

Responsible for directing of installation of soil slab vapor pins and installation and data downloads of water level transducer in retention basin and project delivery by WSP staff. A condominium complex consisting of 10 buildings was developed as a brownfield project over this unlicensed former landfill. There have been occurrences of free product in some of the building basement sumps and there have been odors described as oil or solvent, and sub-slab vapor extraction systems were installed. WSP was hired to conduct an investigation of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, install and sample sub slab vapor pins and inspect and seal cracks and joints in the basements. WSP also inspected the adjacent stormwater sewer system using sewer cameras to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the sewer was cleaned by jetting. WSP then developed design specifications for dredging the detention basin to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided construction oversight of the contractor on behalf of EGLE.

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Project Manager; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 -
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ongoing). Responsible for leading team and directing of installation of monitoring wells, soil vapor points, coordination with construction contractors during building demolition and soil excavation activities. WSP reviewed project deliverables and developed of project approaches in support of brownfield redevelopment. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the

**demolition**. After the building was demolished, WSP conducted a waste **characterization investigation** of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of **sewer cameras**) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a **site-wide soil gas survey** to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. **Vapor mitigation systems were installed** in nearby residences based on soil vapor analytical results. WSP developed separate **design bid specifications** for both onsite and offsite **soil excavation** and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and **conducted oversight** of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

# Douglas Saigh, Senior Hydrogeologist

Roles/Responsibilities: Project Manager, Construction Oversight	
Years of Experience: 23	Education: BS, Hydrogeology, 1999
Direct Employee, Novi, MI	<b>Registrations/Certifications:</b> Asbestos Inspector - MI, Asbestos Planner - MI; Asbestos Designer - MI, Certified Storm Water Operator-Construction Sites

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### **Relevant Experience**

Field Lead; EGLE Part 201 Cal's Car Care, Northville, MI (2008 - ongoing). Project recognized as a redevelopment "Success Story" by the EGLE. Mr. Saigh was responsible for planning, scheduling, and performing all environmental related field work for this project, which included completing soil borings, groundwater well installation, soil vapor sampling points, installation and interpretation of passive soil gas samplers, oversight of excavation within former automotive repair garage area, installation of NAPL collection sump, and sample collection of soil, groundwater, and soil gas for laboratory analysis. WSP designed and directed a multi-phase groundwater, soil, soil gas, and indoor air remedial investigation involving commingled releases from leaking underground petroleum storage tanks and a former drycleaning business. Identified onsite source areas using passive soil vapor sampling. Planned and implemented multi-phased vapor intrusion assessments at neighboring properties, including the City's municipal offices plus several commercial and residential properties. Assessments involved comparison of groundwater samples to rapidly evolving vapor intrusion screening levels, installation of exterior soil gas monitoring points, analysis of sub-slab soil gas, and indoor air sampling. Coordinated field sampling with brownfield redevelopment activities. Investigation results used by developer to include passive vapor mitigation system (VMS) in construction plans. When post-installation indoor air samples showed passive VMS not performing as intended, conducted a focused feasibility study to evaluate potential VMS options. WSP designed recommended modifications, provided construction oversight of the improvements, and conducted performance monitoring to evaluate effectiveness.

Asbestos and Regulated Material Survey (RMS) Technical Lead; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010 - ongoing). Responsible for technical planning and reviewing the asbestos and RMS completed for multiple outbuildings located on the site. Scope involves **remedial investigation** and **design specifications** at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, **geophysical investigation** in residential neighborhood, **vapor intrusion investigation** onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) **pilot study**, in-situ chemical oxidation (ISCO) bench and **pilot studies**, and **asbestos and RMS** for the demolition of existing storage and groundwater treatment buildings. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of **design specifications** and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. An **RMS, geotechnical investigation**, and **waste characterization sampling** were completed, and multiple monitoring **wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

Field Lead; EGLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 - ongoing). As field lead, Mr. Saigh was responsible for the scheduling, coordination, and office technical support during the initial phase of the subsurface investigation across the site. A condominium complex consisting of 10 buildings was developed as a **brownfield project** over this unlicensed former landfill. There have been occurrences of free product in some of the building basement sumps and odors described as oil or solvent, and sub-slab vapor extraction systems were installed. WSP was hired to conduct an investigation of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, install and sample sub slab vapor pins, and inspect and seal cracks and joints in the basements. WSP also inspected the adjacent stormwater sewer system using sewer cameras to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the sewer was cleaned by jetting. WSP then developed design specifications for dredging the detention basin to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided **construction oversight** of the contractor on behalf of EGLE.

Asbestos and RMS Technical Lead; ECLE Part 201, Michner Plating, Jackson, MI (2018 – ongoing). Mr. Saigh was responsible for the planning, scheduling, and technical review of the asbestos and RMS for the former plating building. Mr. Saigh also provided asbestos and regulated material abatement and disposal regulatory guidance to the EGLE PM for level of effort and cost estimate planning purposes for the removal and disposal of asbestos and other regulated materials and building demolition. Due to the estimated abatement, disposal, and demolition costs, EGLE was able to postpone the building demolition and focus funding on ongoing environmental investigations related to the site. Scope involves conducting Phase | &II Environmental Site Assessments, and an RMS. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical and petroleum-stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of **PFAS.** As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three

onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the **installation of two vapor mitigation** systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

Asbestos and RMS Lead; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 ongoing). WSP reviewed project deliverables and developed of project approaches in support of **brownfield redevelopment**. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization **investigation** of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

*Project Manager; ECLE Part 201, 17627 Conant Street, Detroit, MI (2019 – ongoing).* As project manager, Mr. Saigh is responsible for managing WSP project staff, maintaining constant and direct communication with the EGLE PM for work progress and budget spend, providing solutions to environmental problems to meet regulatory requirements and EGLE PM's approval, and managing the Trade Contractor during asbestos and regulated material abatement and building demolition. Mr. Saigh also provided insight and options to add and implement a monthly sewer gas monitoring program requested by the EGLE PM. WSP implemented and conducted/managed the building demolition and a site-wide subsurface soil, groundwater, and sewer gas **investigation** in support of **brownfield redevelopment**. Scope of work included historical records review, **asbestos inspection, lead-based paint sampling**, and an **RMS** and preparation of a characteristically hazardous building materials evaluation. WSP developed **design bid specifications** for building demolition. WSP assisted

EGLE with procurement of a demolition contractor and conducted **oversight during the demolition**. WSP has completed the field work portion of this project in December 2022 and is currently preparing the summary report and monthly sewer gas monitoring report.

Project Manager; EGLE Part 201, 6598 Helen Street, Detroit, MI (2020-ongoing). As project manager, Mr. Saigh is responsible for managing WSP project staff, maintaining constant and direct communication with the EGLE PM for work progress and budget spend, providing solutions to environmental problems to meet regulatory requirements and EGLE PM's approval, and managing the Trade Contractor during asbestos and regulated material abatement, building demolition, UST removals, soil excavation and disposal, and site restoration. Mr. Saigh also provided insight and options to add and implement a monthly sewer gas monitoring program requested by the EGLE PM. WSP implemented and conducted/managed the remedial actions completed by the Trade Contractor and a site-wide subsurface soil, groundwater, and sewer gas investigation in support of brownfield redevelopment. This brownfield redevelopment project began as a remedial investigation (RI) of soil and groundwater at this former gas station. WSP conducted an RMS. The survey included asbestos, lead-based paint, and stained concrete sampling. Based on the results of the RI and RMS, WSP developed design bid specifications for asbestos and regulated material abatement and disposal, building demolition, UST removals, excavation of impacted soil, and site restoration. WSP assisted with Trade Contractor procurement and provided daily oversight during the Trade Contractor work. WSP has completed the field work portion of this project in December 2022 and is currently preparing the summary report and monthly sewer gas monitoring report.

Asbestos and RMS Technical Lead; EGLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 - ongoing). Mr. Saigh was responsible for the planning and technical review of the asbestos and RMS completed by WSP and reviewed waste characterization information and sample data to evaluate the presence of listed and characteristic hazardous waste. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Site CSM and conducted a subsequent data gap investigation to support remedial design, PRB performance monitoring plan and VIAP assessment work plan to address residual hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a focused feasibility study to address the residual source and provided stakeholder outreach support and PRB operation, monitoring, and maintenance in support of EGLE. WSP developed design bid specifications for the demolition of the Site building, which was funded through a Brownfield Redevelopment Grant. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted construction oversight during the demolition. After the building

was demolished, WSP conducted a waste **characterization investigation** of the soil and groundwater. WSP is currently completing a **bench study** to determine amendment mix ratios needed to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the insitu remediation of soil and groundwater, which may also include excavation.

# Sean Gormley, Principal Chemist

Roles/Responsibilities: PFAS National Lead, Environmental Investigation	
Years of Experience: 35	Education: BS, Chemistry, 1987
Direct Employee, Portland, OR	<b>Registrations/Certifications:</b> Certified Environmental Analytical Chemist (CEAC), National Registry of Certified Chemists (NRCC), Registrant No. 2630; Certified Hazardous Materials Manager (CHMM), Institute of Hazardous Materials Management (IHMM), Certificate No. 11609

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

### Relevant Experience

### Project Chemist; EGLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2015 -

ongoing). Mr. Gormley provided senior review of data validation and technical consultation on analytical chemistry of PFAS for environmental samples. RI activities included delineation of metals-related impacts in soil and groundwater using sonic drilling methods and assessment of migration into and along historic tannery and municipal storm water utility infrastructure. Constructed CSM for use in a focused feasibility study to address metals and buried hides at the Site, which were subsequently excavated as part of two IRMs. Worked with WSP and EGLE toxicologists to develop site-specific criteria for lead and arsenic using results from an in-vivo bioavailability assessment (IVBA). PFAS were identified in Site soil and groundwater. WSP characterized PFAS in soil, groundwater, and surface water, collected additional data to support CSM development and implemented PFAS immobilization bench top and pilot scale studies at the Site. Pilot test studies performed at the Site included: direct push injection and soil mixing of biochar into the formation to reduce PFAS concentrations/migration in groundwater and to reduce infiltration into the submerged, impacted storm water infrastructure; emplacement of biochar mitigation materials into historical storm water infrastructure to mitigate direct migration of PFAS to the Thunder Bay River and recent studies to assess microbially enhanced transformation and/or destruction of PFAS using endemic microbes. WSP provided oversight of well abandonment and completed a remedial design, followed by construction oversight of a focused paved "cap" to reduce leaching to groundwater from vadose soil and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors.

*Project Chemist; Confidential Landfill, MI (2018 - ongoing).* Samples from the onsite groundwater treatment system showed PFOS and PFOA above USEPA health advisory levels and above Michigan health-based drinking water values. To evaluate potential PFAS treatment upgrades for the system, Wood **designed, constructed, and operated** an onsite **PFAS** Treatment Column Study that demonstrated the effectiveness of GAC and non-regenerable IX resin. Wood **designed the groundwater treatment system** and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 140 gallons per minute, consisting of 3 x 70-cubic feet ion-exchange resin vessels for PFAS removal, an air stripper for VOC removal, and a

deposit control and solids management system to maximize system uptime. The design also included the treatment system building and the controls system to remotely monitor the system. WSP is providing **construction oversight** of the modifications. Once the system is constructed, **Wood will provide operation and maintenance services for our client.** 

*Project Chemist; AFCEC BRAC Midwest BECOS Remedial Action, Former Wurtsmith Air Force Base (AFB); Sub to LCES JV (2021 –***ongoing)**. As part of the RA-O and LTM activities, WSP is currently **operating**, **maintaining**, **and monitoring** three groundwater pump and treat systems for **PFAS**. Treatment technologies include ion-exchange resin and granular activated carbon. Provides technical reviews if documents including a Program-wide QAPP and Health and Safety Plan.

Project Chemist; Former JB Sims Generating Station-Harbor Island, Grand Haven, MI (2022 ongoing). Project Chemist for Data Gap Investigation. WSP is contracted, under HDR Michigan, Inc, to support the restoration of the former JB Sims Generating Station located in Harbor Island, City of Grand Haven, Michigan. Harbor Island has been used for industrial purposes and waste disposal for over 100 years for city trash (unlined dump site/landfill), dredge materials, and coal ash from JB Sims Plant Units 1 & 2 impoundments among other previous industrial uses. WSP is responsible for the non-Coal Combustion Residuals (CCR) Constituents of Concern (primarily PFAS) investigation, remediation design and implementation to be able to restore the Site into recreational or other use identified by the City of Grand Haven. First step of the project included development of initial CSM based on available non-CCR data and identification of data gaps. Supporting **Data Gap Investigation**, which will include vertical aquifer profiling (VAP) to identify the dump site location and PFAS source(s) and follow up monitoring well installations and surface water sample collection from surface water bodies located within and adjacent to the site. During our next phase of work, Mr. Gal will be our lead technical resource, including the engineering lead for the feasibility study to compare remediation options. Pending funding and completion of our feasibility study, remediation will be implemented to support Harbor Island Restoration activities and brownfield redevelopment plans for the property.

Project Chemist; Site Investigation of PFAS at Multiple BRAC Installations (including Wurtsmith, KI Sawyer, & Escanaba MI), Multiple States (2013-2018). Mr. Gormley has served as the WSP Program Chemist for Preliminary Assessments and Site Investigations of PFASs related to use of aqueous film forming foam (AFFF) at 39 former Air Force Bases being conducted on behalf of the Air Force Civil Engineering Center. His primary responsibilities include technical consultation on environmental and analytical chemistry of per- and polyfluoroalkyl substances (PFAS), preparation and review of quality related documents related to analytical chemistry data, and oversight of the analytical laboratory program, which included three contract laboratories. An important aspect of the chemical data quality assurance (QA) program involved efforts to evaluate and manage the comparability of data produced by the three contract laboratories. Mr. Gormley designed and directed a program that employed careful review of laboratory procedures, including modifications to EPA Method 537, on site audits of contract laboratory facilities, interlaboratory split samples, and proficiency testing (PT) samples to evaluate data comparability. PT samples submitted to the laboratories before the program started were Standard Reference Materials (SRMs) obtained from the National Institute of Standards and Technology (NIST) and included a limited suite of PFAS analytes. Due to expansion of the required analyte list during the program, Mr. Gormley

designed a second PT program using custom prepared certified reference materials obtained from an analytical reference materials vendor. These PT samples included 25 individual PFAS analytes, and were submitted to the three project contract laboratories and a fourth laboratory not used for this program. WSP provided Perfluorinated Compounds (PFCs) site investigations at 11 BRAC Bases throughout the continental United States (Castle AFB, CA, Chanute AFB, IL, Loring AFB, ME, KI Sawyer AFB, MI (including the Escanaba GSU), Wurtsmith AFB, MI, Pease AFB, NH, Griffiss AFB, NY, Plattsburgh AFB, NY, Kelly AFB, TX, Reese AFB, TX and General Mitchell ARS, WI). Performed Site Investigations at 157 AFFF areas located at 11 BRAC installations in 8 states. In addition, this project included implementation of a **pilot-scale groundwater treatment** using ion exchange resin **remediation** technology based on the promising results of a **bench scale test**, which led to the design of two large-scale groundwater treatment plants (200 to 500 gpm).

*Project Chemist; Air National Cuard Base Contract PFAS, 20 Bases, 16 States (2016-2019).* Mr. Gormley served as the WSP Program Chemist for site investigations of **PFASs** at 20 sites in 16 states with 181 separate areas, including initial **assessments** of sites impacted by past use of AFFF. His primary responsibilities included technical consultation on environmental and analytical chemistry of PFASs, preparation and review of quality related documents related to analytical chemistry data, and oversight of the analytical laboratory program. WSP performed Phase 1 **Site inspections** for the presence of **per- and polyfluoroalkyl substances (PFAS)**, also referred to as perfluorinated chemicals (PFCs), at twenty Air National Guard bases throughout the United States. **Assessed** these bases for the presence or absence of PFAS compounds in soil, groundwater, sediment and surface water. The work involved the advancement of soil borings, installation of new groundwater monitoring wells, and use of existing monitoring points to provide a picture of PFAS impacts and potential direction of transport towards base property boundaries.

# Shalene Thomas, PMP, Contaminants Program Manager

Roles/Responsibilities: PFAS National Lead	
Years of Experience: 24	<b>Education</b> : MS, Environmental Science & Mgmt. 1998; BS, Biology, 1996
Direct Employee, Minneapolis, MN	<b>Registrations/Certifications:</b> Project Management Professional (PMP)

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

Relevant Experience

*PFAS Advisor; Confidential Landfill, MI (2018 - ongoing).* Samples from the onsite groundwater treatment system showed PFOS and PFOA above USEPA health advisory levels and above Michigan health-based drinking water values. To evaluate potential **per- and polyfluoroalkyl substances (PFAS)** treatment upgrades for the system, WSP **designed, constructed, and operated** an onsite **PFAS** Treatment Column Study that demonstrated the effectiveness of GAC and non-regenerable IX resin. WSP **designed the groundwater treatment system** and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 140 gallons per minute, consisting of 3 x 70-cubic feet ion exchange resin vessels for PFAS removal, an air stripper for VOC removal, and a deposit control and solids management system to maximize system uptime. The design included the treatment system building and the controls system to remotely monitor the system. WSP is providing **construction oversight** of the modifications. Once the system is constructed, **WSP will provide operation and maintenance services for our client.** 

*PFAS Advisor; AFCEC BRAC Midwest BECOS Remedial Action, Former Wurtsmith Air Force Base (AFB); Sub to LCES JV (2021 – ongoing).* As part of the RA-O and LTM activities, WSP is currently **operating, maintaining, and monitoring** three groundwater pump and treat systems for **PFAS**. Treatment technologies include ion exchange resin and granular activated carbon. Provides technical reviews of documents including Program QAPP and Health and Safety Plan.

PFAS Advisor; Former JB Sims Generating Station-Harbor Island, Grand Haven, MI (2022 – ongoing). WSP is contracted, under HDR Michigan, Inc, to support the restoration of the former JB Sims Generating Station located in Harbor Island, City of Grand Haven, Michigan. Harbor Island has been used for industrial purposes and waste disposal for over 100 years for city trash (unlined dump site/landfill), dredge materials, and coal ash from JB Sims Plant Units 1 & 2 impoundments among other previous industrial uses. WSP is responsible for the non-Coal Combustion Residuals (CCR) Constituents of Concern (primarily PFAS) investigation, remediation design and implementation to be able to restore the Site into recreational or other use identified by the City of Grand Haven. First step of the project included development of initial CSM based on available non-CCR data and identification of data gaps. Supporting Data Gap Investigation, which will include vertical aquifer profiling to identify the dump site location and PFAS source(s) and follow up monitoring well installations and surface water sample collection from surface water bodies located within and adjacent to the site. During our next phase of work, Mr. Cal will be our lead technical resource, including the engineering lead for the feasibility study to compare remediation options. Pending funding and completion of our feasibility study, remediation will be implemented to support Harbor Island Restoration activities and brownfield redevelopment plans for the property.

*PFAS Technical Lead; Site Investigation of PFAS at Multiple BRAC Installations (including Wurtsmith, KI Sawyer, & Escanaba MI), Multiple States (2013-2018).* Ms. Thomas served as the PFAS technical lead for the project. Developed and delivered calibration training to project team that covered **PFAS** project planning, project execution and SOP review, and nomenclature and fate and transport for data analysis and reporting. Served to inform the team regarding regulatory changes at State and Federal level as well as planning in anticipation of changes. Attended project meetings on behalf of WSP and the AF. WSP provided Perfluorinated Compounds (PFCs) **site investigations** at 11 BRAC Bases throughout the continental United States (Castle AFB, CA, Chanute AFB, IL, Loring AFB, ME, KI Sawyer AFB, MI (including the Escanaba GSU), Wurtsmith AFB, MI, Pease AFB, NH, Griffiss AFB, NY, Plattsburgh AFB, NY, Kelly AFB, TX, Reese AFB, TX and General Mitchell ARS, WI). Performed Site Investigations at 157 AFFF areas located at 11 BRAC installations in eight states. In addition, this project included implementation of a **pilot-scale groundwater treatment** using ion exchange resin remediation technology based on the promising results of a **bench scale test**, which led to the **design** of two large-scale groundwater treatment plants (200 to 500 gpm).

**PFAS Technical Lead; Investigation Activities at Multiple Air National Cuard (ANG) Installations, Great Lakes Region, United States (2015-2020).** Ms. Thomas served as the PFAS technical lead for the project and specifically the Duluth site. Attended meetings on behalf of WSP and the ANG and served as technical resource in discussing **PFAS** regulatory status in Minnesota, proactive planning for changes in regulations/guidance, and PFAS field program. Project included **remedial investigation** activities at multiple sites across five ANG bases across three states including Selfridge ANGB and Alpena CRTC in Michigan; Minneapolis ANGB and Duluth ANGB in Minnesota; and Mitchell ANGB in Wisconsin. RI/FS work at Duluth included investigation of a former fire training area for PFAS compounds.

**PFAS Technical Lead; ANG Base Contract PFAS, 20 Bases, 16 States (2016-2019).** Ms. Thomas served as the PFAS technical lead for the project. Served to inform the team regarding regulatory changes at State and Federal level as well as planning in anticipation of changes. Attended project meetings on behalf of WSP and the AF. WSP performed Phase 1 **Site inspections** for the presence of **PFAS**, also referred to as perfluorinated chemicals (PFCs), at twenty ANG bases throughout the United States. **Assessed** these bases for the presence or absence of PFAS compounds in soil, groundwater, sediment and surface water. The work involved the advancement of soil borings, installation of new groundwater monitoring wells, and use of existing monitoring points to provide a picture of PFAS impacts and potential direction of transport towards base property boundaries.

*PFAS Technical Lead; Drinking Water Sampling for PFAS and Contingent Drinking Water Supply at seven ANG Sites, National Guard Bureau (ANG), Various Cities throughout the United States (2017-2022).* Ms. Thomas served as the PFAS technical lead for the project. Developed and delivered stakeholder communication plan. Served to inform the team regarding regulatory changes at State and Federal level as well as planning in anticipation of changes. Serves as a resource for the 1-800 hotline to support stakeholder inquiries. WSP performed drinking water sampling for the presence of PFAS, also referred to as perfluorinated chemicals (PFCs), at seven ANG bases throughout the United States. Provided contingent drinking water supplies (bottled water) as mitigation measures where findings exceeded the established health advisories.

# David Woodward, Principal Consultant

Roles/Responsibilities: PFAS National Lead	
Years of Experience: 38	<b>Education</b> : BS, Earth Science/Cartography/Mined Land Reclamation, 1984
Direct Employee, Alpharetta, GA	Registrations/Certifications: HAZWOPER 40 hour

### **RED BOLD DENOTES** *KEY PROJECTS*, **PROJECT TYPES AND SERVICES OFFERED**

#### Relevant Experience

Subject Matter Expert Technical Support, Kalamazoo River Superfund Site, Kalamazoo, MI (2013-ongoing). Provided technical support on sampling/analysis and waste management options for wastes generated during Interim Response Actions. the Kalamazoo River is a "Great Lakes Area of Concern" with nearly 100 years of historic industrialized use. Discharges from numerous industrial facilities have resulted in polychlorinated biphenyls (PCBs) in sediments, floodplain soils and fish. The Kalamazoo River Superfund Site consists of 80 miles of river, hundreds of miles of adjoining shoreline, 1,600 acres of lake and thousands of acres of outlying floodplains. Sediment Management and Dam Removal-WSP's design also aimed at the goal of removing a temporary dam and meeting MDNR's goal of restoring river connectivity in the area. Design engineering plans for removal of the temporary dam included lowering the impoundment and managing accumulated sediment. While impacted sediment was removed from the Site and disposed, an approximate 2,000-foot-long pilot channel was dredged along the historical thalweg of the river upstream of the temporary dam. The pilot channel allowed for preferential placement of the designed river thalweg, lowering of the impoundment via the temporary dam water control structure, and mobilization of clean sediment either downstream or for beneficial reuse onsite. Clean sediment removed via the pilot channel dredge was hydraulically pumped to a former spillway hole, without dewatering, which allowed for cost-effective stabilization and restoration of that portion of the Site. Lowering of the impoundment through the pilot channel also facilitated additional, more costeffective work in the dry along former riverbanks.

## PFAS Subject Matter Expert Technical Support, Confidential Landfill, MI (2017-ongoing).

Provided technical support for sampling/analysis, design, and modifications. Samples from the onsite groundwater treatment system showed PFOS and PFOA above USEPA health advisory levels and above Michigan health-based drinking water values. To evaluate potential PFAS treatment upgrades for the system, WSP **designed**, **constructed**, **and operated** an onsite **PFAS** Treatment Column Study that demonstrated the effectiveness of Granular Activated Carbon (GAC) and non-regenerable IX resin. WSP **designed the groundwater treatment system** and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 140 gallons per minute, consisting of 3 x 70-cubic feet ion exchange resin vessels for PFAS removal, an air stripper for VOC removal, and a deposit control and solids management system to maximize system to remotely monitor the system. WSP is providing **construction oversight** of the modifications.

Once the system is constructed, **WSP will provide operation and maintenance services for our client.** 

PFAS Subject Matter Expert Technical Support, EGLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2018-ongoing). Provided technical support on Conceptual Site Model and remedy options. PFAS were identified in Site soil and groundwater. WSP characterized PFAS in soil, groundwater, and surface water, collected additional data to support Conceptual Site Model (CSM) development and implemented PFAS immobilization bench top and pilot scale studies at the Site. Pilot test studies performed at the Site included: direct push injection and soil mixing of biochar into the formation to reduce PFAS concentrations/migration in groundwater and to reduce infiltration into the submerged, impacted storm water infrastructure; emplacement of biochar mitigation materials into historical storm water infrastructure to mitigate direct migration of PFAS to the Thunder Bay River and recent studies to assess microbially enhanced transformation and/or destruction of PFAS using endemic microbes. WSP provided oversight of well abandonment and completed a remedial design, followed by construction oversight of a focused paved "cap" to reduce leaching to groundwater from vadose soil and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors.

*Project Advisor - Confidential Fire-Fighting Equipment Manufacturer, Fire Training Center Remediation, Waderslough, Germany (2012-2017).* Served as a Project Advisor on the **remediation** of a large fire training center impacted with comingled **PFASs**, petroleum hydrocarbons, and chlorinated VOCs. The remediation involved the capping and containment of soil, installation of a groundwater containment and GAC treatment system, and **excavating** and reconstructing a contaminated pond.

*Project Advisor - Confidential Industrial Client - Decatur, Alabama (2012-2015).* Served as Project Advisor on a **PFAS** project involving the characterization of **PFASs in surface water**, **sediments, soil, groundwater, agricultural crops, and livestock**. The PFASs originated in wastewater biosolids from a municipal wastewater treatment plant. The biosolids were beneficially reused as fertilizer on agricultural fields across several rural Counties and resulted in PFAS contamination throughout the food chain and dozens of impacted groundwater supply wells. The project is currently the subject of several class action lawsuits.

*Natural Sciences and Engineering Research Council of Canada ENGAGE Research Grant – (2015–2016).* Conducted research to evaluate **feasibility** potential low-cost sorbent material for Permeable Reactive Wall treatment to remove **PFASs** from contaminated groundwater. This research was led by Dr. Loretta Li at the University of British Columbia. Mr. Woodward served as the technical advisor on the project.

Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) PFAS Remediation Grants (2017ongoing). Serving as a Technical Advisor on a SERDP PFAS R&D project and Co-Principal Investigator on an ESTCP PFAS R&D project involving the use of ion exchange (IX) resins to remove PFAS from groundwater. The IX resins are regenerated using a solvent/brine solution into a concentrated regenerant solution. The PFAS are then destroyed onsite in a novel Plasma Reactor that generates a variety of oxidative and reductive species that collective destroy a wide variety of PFAS compounds. The SERDP project also involves evaluating the potential to oxidize long chain polyfluorinated precursor PFAS in situ using a variety of chemical oxidants.

*Australian Defence R&D Grant (2017).* Served as Project Advisor on **Phytoremediation**, Plant Uptake, and stabilization R&D projects at the Army Aviation Centre Oakey. The plant uptake project involved growing plants in **PFAS** impacted soil that was irrigated with PFAS impacted groundwater to assess the fate and transport of PFAS in a variety of commercial crops.

*Project Advisor - Trafikverket - Investigation of Regional Airport - Stockholm Sweden - (2017).* Served as Project Advisor on large investigation of regional airport that had released **Aqueous Film Forming Foams (AFFF)** and impacted surface water and groundwater.

*Confidential Client, Rose Township Superfund Site, Rose Township, MI (2017-ongoing).* Serving as Technical advisor associated with remediation of a large, chlorinated solvent plume that has impacted offsite residential wells. Work has included an evaluation of monitored natural attenuation and reductive dechlorination as a remedy and the design and coordination of a **pilot study**.

*Technical Lead, PFAS Litigation Support - Confidential Client – U.S (2018-2020).* Project involving individual and class action lawsuits for historic **PFAS** releases from multiple manufacturing facilities. The potential sources include permitted wastewater and air discharges, wastewater leach fields, and offsite waste disposal. The PFAS releases have resulted in impacted residential and municipal water wells and impacts to a nearby river used for recreational fishing. Our initial assignment on the project is to recreate the operational history relative to PFAS use and estimate all air and water discharges. We anticipate that the role will also include fate/transport analysis, development of the Conceptual Site Model, and supporting allocation amongst responsible parties.

*Fire-fighting Foam Risk Assessment Joint Industry Project - Petroleum Environmental Research Forum (PERF) (2018-2020).* Leading the Conceptual Site Model task on a joint industry project involving an evaluation of the environmental tradeoffs of Fluorine Free Foams vs. C6 AFFF. This industry funded R&D project includes a team of experts in **PFAS** analytical chemistry, toxicology, and fate/transport.

**Technical Advisor; Site Investigation of PFAS at Multiple BRAC Installations (including Wurtsmith, KI Sawyer, & Escanaba MI), Multiple States (2018–2021).** At Wurtsmith AFB, Mr. Woodward performed technical reviews on project deliverables and is supporting the development of a CSM for **PFAS** impacts across the former base and offsite. He also previously conducted an Air Force research and development (R&D) project at the site evaluating innovative ex situ PFAS groundwater treatment technologies including: Enzymeamended GAC; and RemBind<sup>™</sup> which is a patented blend of GAC, Organo-clays, and Aluminum Hydroxide. At Pease AFB, he has supported the CSM development, conducted **bench and pilot treatment tests** using ion exchange resin, and is supporting the design of two large-scale groundwater treatment systems (200 to 500 gpm).

*Technical Lead, Clobal PFAS Consulting Support – Confidential Major Oil Company (2019ongoing).* Providing Global **PFAS** Program Support including developing a legacy site risk ranking system, foam transition plan and implementation support, regulatory tracking and advocacy, best management practices support, policy and response action development, and developing Strategic Plans and CSMs for large complex sites. *Technical Advisor; Camp Grayling Army Airfield, Michigan Army National Guard, Camp Grayling, MI. (2019-ongoing).* Provided senior technical review of the CSM and providing ongoing support related to **Point of Entry Treatment systems** on offsite residential supply wells. Onsite sampling included the advancement of 60 vertical profile borings along with sample collection. Following identification of contamination offsite potable well sampling was performed collecting samples from 200 plus homes serviced by potable wells. Continued **investigation** sampling plan with collection of samples from municipal supply wells and surface waters. Provided senior technical review and direction in the design and implementation of a passive barrier wall **pilot test** to evaluate the effectiveness of Regenesis' PlumeStop®in retarding the migration of PFAS and other contaminants in the shallow drinking water aquifer. Preliminary results from ongoing post injection monitoring are favorable.

### Assessing the Use of Fluorinated and Fluorine Free Fire-fighting Foams - European

*Commission (2021-2022).* Served as the **PFAS remediation** expert on a European Commission Project involving an assessment of the use of fluorinated and fluorine free fire-fighting foams looking specifically at their volumes, functions and emissions and at the costs for remediation of soil and water when the fire-fighting foams are released. Based on this and additional information from a parallel European Chemicals Agency study about the **feasibility of alternatives** and their socioeconomic impacts, Wood will develop a risk management option analysis (RMOA) to allow the Commission to identify the most appropriate instrument for possible regulatory risk management activities to address the concerns resulting from PFASs in fire-fighting foams.

# PFAS Subject Matter Expert Technical Support, Remedial Investigation for Per- and Polyfluoroalkyl Substances (PFAS) FORMER JB SIMS GENERATING STATION-HARBOR

ISLAND, Grand Haven, MI (2022). Provided technical support related to tannery wastes discovered during investigations. WSP is contracted, under HDR Michigan, Inc, to support the restoration of the former JB Sims Generating Station located in Harbor Island, City of Grand Haven, Michigan. Harbor Island has been used for industrial purposes and waste disposal for over 100 years for city trash (unlined dump site/landfill), dredge materials, and coal ash from JB Sims Plant Units 1 & 2 impoundments among other previous industrial uses. WSP is responsible for the non-Coal Combustion Residuals (CCR) Constituents of Concern **investigation, remediation design** and implementation to be able to restore the Site into recreational or other use identified by the City of Grand Haven. First step of the project included development of initial CSM based on available non-CCR data, identifying data gaps. Data Gap Investigation will include vertical aquifer profiling (VAP) to try to identify the dump site location and PFAS source as well as groundwater flow direction. Based on results from groundwater samples collected from the VAP borings, up to 10 groundwater monitoring wells will be installed, gauged and sampled quarterly for a year as well as surface water samples from surface water bodies located within the site. A remedial investigation will be implemented and a feasibility study will be developed to compare remediation options. Based on funding, remediation will be implemented to support Harbor Island Restoration activities. Project activities also include **public communication**, coordination with EGLE and Water Resource Department as well as City officials, Michigan Attorney General office, and elected officials to help secure grants to support project activities.

# Anita Emery-DeVisser, CMNSP, Senior Scientist

Roles/Responsibilities: Environmental Investigation	
Years of Experience: 37	Education: MS, Resource Development, Natural Resource
	Mgmt., BS, Geography
Direct Employee, Novi, MI	<b>Registrations/Certifications:</b> Certified Michigan Natural Shoreline Professional; HAZWOPER 40 Hr.

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

**Relevant Experience** 

Project Manager; MDNR Part 201 Former Rose Lake Shooting Range, Bath, MI (2009 – 2019).

Responsible for developing project scope to meet project objectives, and work toward MDNR goals. Project scope to characterize the extent of lead contamination at a former skeet/trap shooting range located within a State Game Area that has a wide and deep lead shot pattern and overlaps over 5 acres of wetlands. During the remedial investigation, assisted the selection of decision units for multi-incremental sampling investigation, completed sampling, and completed lead stabilization treatability study. Approximately 80 samples were collected from down range areas and analyzed for total lead, and a limited number of samples for TCLP lead. The extent of lead impacted soils was defined using generic Part 201 cleanup criteria. Most of the shot fall zone lies within a scrub/shrub wetland. Site ecological and human health risks to lead exposure are being evaluated using site specific information. A Baseline Ecological Risk Study was conducted to assess the lead exposure to small mammals, invertebrates, and the overall effect on the food chain. For the **feasibility study**, completed a technology evaluation for 11.5 acres that were selected based on multi-incremental sampling results. Based on site specific ecological based screening levels, minimized remedial footprint using multiincremental sampling methods, prepared cost estimates, evaluated technologies for a variety of general remedial responses (e.g., containment, in-situ stabilization, and removal solutions), and conducted several regulatory meetings with MDNR and EGLE wetland permitting officers to select a soil relocation option where impacted soils would potentially be reused for berms at a 200-yard-long shooting range if soils are rendered non-hazardous. Soil relocation option is expected to significantly reduce otherwise expensive disposal costs and dramatically increase sustainability options for similar impacted skeet ranges undergoing remedial evaluations.

## Senior Scientist; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010 -

*ongoing).* Responsible for developing field sampling work plans for offsite properties, including incremental sampling methodology to investigate adjoining school property. Project scope involves **remedial investigation** and **design specifications** at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, **geophysical investigation** in residential neighborhood, **vapor intrusion investigation** onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) **pilot study**, and insitu chemical oxidation (ISCO) bench and **pilot studies**. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering

air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of **design specifications** and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A **regulated materials survey**, **geotechnical investigation**, and **waste characterization sampling** were completed, and multiple monitoring **wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** for EGLE during full-scale soil excavation.

*Project Manager; Confidential Client, Kalamazoo River Superfund Site, MI (2013 – ongoing).* The Kalamazoo River is a Great Lakes AOC with nearly 100 years of historic industrialization use which has resulted in PCBs in sediments, floodplain soil and fish. As Project Manager, responsible for the project scope, schedule, and budget as well as data gap sampling (including incremental sampling) to evaluate human health risks to PCB contamination in floodplains, and to complete remedial design. Tasks included completing **remedial investigations** and data gap investigations, updating ecological and human health **risk assessments**, and preparation of supporting documents. As the PM, led work group meetings that included the client, USEPA, EGLE, MDNR, USFW and State trustees. WSP completed three **remedial designs** for two subreaches of the river, followed by **construction oversight** during remediation work and removal of a water control structure, followed by **wetland restoration and monitoring**.

*Project Manager; EGLE Part 201, Telecraft Shopping Center, Redford, MI (2017 – ongoing).* As Project Manager responsible for developing the scope of work, budget, and schedule to achieve project objectives. WSP conducted a soil, groundwater, and **soil gas investigation** of a tetrachloroethylene (PCE) plume associated with a former dry cleaner, which extends beneath a residential apartment complex, located immediately downgradient of the Site. Additionally, the Rouge River is located approximately 1,000-feet downgradient of the Site. To assess CSI risk, contaminant fate and transport was assessed for possible migration to the Rouge River. Evaluation of the **vapor intrusion pathway** related to shallow groundwater on the adjacent residential apartment complex is ongoing, as well as quarterly groundwater and soil vapor sampling. Additional assessment of the soil vapor pathway was conducted at the apartment complex by completing vapor sampling and a **camera survey within the sewer lines.** Soil, groundwater, and soil vapor data collected is currently being evaluated by the project team for use in preparation of a focused **feasibility study.** 

Project Manager; ECLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 - ongoing). Responsible for developing a scope of work, budget and schedule to accomplish project objectives. A condominium complex consisting of 10 buildings was developed as a **brownfield project** over this unlicensed former landfill. There have been occurrences of **free product** in some of the building basement sumps and there have been odors described as oil or solvent odors and sub-slab vapor extraction systems were installed. The scope of work included an **investigation** of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, **install and sample sub slab vapor pins** and inspect and seal cracks and joints in the basements. Additionally, WSP inspected the adjacent stormwater sewer system using **sewer cameras** to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the **sewer was cleaned by jetting**. WSP then developed **design specifications** for **dredging the detention basin** to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided **construction oversight** of the contractor on behalf of EGLE.

Project Manager; EGLE Part 201 Remedial Investigation, Feasibility Study, Interim Measures and Source Remediation; Former Magnetek Site, Owosso, MI (1999-2020). As Project Manager, coordinated and conducted remedial investigation of a former electronic parts manufacturer and drycleaner. Contamination affected soils, groundwater, surface water and vapor intrusion into indoor air of two businesses. Another source area was identified at a former dry cleaner, which contributed to the groundwater contaminant plume and caused indoor air issues in a restaurant and medical center. Interim remedial measures were implemented to reduce indoor air exposures. Besides the soil and groundwater investigation, extensive soil vapor, indoor air and sub-slab vapor sampling was conducted. Completed final review of a feasibility study of corrective actions that would allow businesses to continue operating and achieve cleanup goals. Thermally enhanced soil vapor extraction, the first used application in Michigan, was selected as the most efficient and cost effective (proven) technology for cleaning up the second source area. WSP prepared a design bid specification package of the remediation system on behalf of the EGLE and MDTMB and supported the procurement of an experienced contractor. WSP provided fulltime construction oversight of the construction contractor. The system was installed in less than 90 days, achieved temperature in 60 days, reduced contaminant mass more than 90 % following 2.5 months of operation. Verification sampling included indoor air, sub-slab vapor and soil. Results indicate project goals were achieved and indoor air inhalation risks are mitigated.

*Senior Scientist; EGLE Part 201 Ruddiman Creek, Muskegon, MI (2001-2007).* Conducted **wetland delineation** and mitigation monitoring prior to and following remedial activities in a wetland bordering Ruddiman Creek. The site was an historic dumping ground for domestic and industrial wastes. Contamination relating to the dumping activities was entering the creek and remedial activities required extensive soil removal, including a wetland.

*Project Manager; ECLE Part 201 Warren and Lakewood Service Station, Detroit, MI (2009-2010).* As Project Manager responsible for planning and execution of an **investigation** of an abandoned service station located in a commercial/residential neighborhood in Detroit. The contamination was limited to the site and under sidewalks. Prepared **design specifications** for the **removal of USTs**, supported the State in the bidding and procurement of a qualified contractor, provided **oversight of construction** activities and provided investigation and construction documentation.

**Project Manager; ECLE Part 201 Michigan Industrial Finishes, Hamtramck, MI (2014-ongoing).** Ms. Emery-DeVisser provided technical direction for the remedial investigation as part of **brownfield redevelopment.** The project began as a **remedial investigation (RI)** of soil and groundwater at an industrial site formerly used to manufacture paint and finish products. The site is approximately two acres and has two large industrial buildings. In addition, WSP conducted a **remedial investigation study (RMS)** of the one of the buildings to be demolished. The survey included **asbestos, lead-based paint**, and stained concrete sampling. Based on the results of the RI and **RMS**, WSP developed bid specifications to demolish the building and remediate the impacted soil, assisted EGLE with procuring a Trade Contractor, and observed and documented the remedial action. The remedial action included excavation, transportation, and offsite disposal of approximately 20,600 tons on impacted soil.

# Len Mankowski, MS, Senior Geologist/Geophysicist

Roles/Responsibilities: Environmental Investigation	
Years of Experience: 18	<b>Education</b> : MS, Geology, 2003; BS, Applied Geophysics, 1999
Direct Employee, Traverse City, MI	Registrations/Certifications: Pending CPG 2023

### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

Lead Hydrogeologist/Geophysicist; EGLE Part 201 Former Wickes Manufacturing; Mancelona, MI (2007 - ongoing). Responsible for integrating remedial investigation activities/results that included rotosonic vertical aquifer sample (VAS), geophysical surveys (seismic p-wave and s-wave reflection profiles, induced polarity and electrical resistivity and down hole gamma logging) and results from well installation to over 500 feet below ground surface, into a conceptual site model (CSM). The Former Wickes Manufacturing trichlorethylene (TCE) Plume is over 6.5 miles long and extends under more than 1,400 properties. WSP performs ongoing monitoring of the groundwater to surface water interface (GSI) pathway via pore and surface water sample collection where a portion of the plume vents to the Cedar River. Coordinated, oversaw, and analyzed multiple geophysical and hydraulic investigations at the Site to assess aquifer connections (via geophysical surveys/geologic correlations and pumping tests) and likely eventual venting to downgradient Shanty Creek (seasonal stream discharge via stream profiles/flow meter). Responsible for preparing analytical models and CSM to support a focused feasibility study (FFS) to address downgradient drinking water exposure. CSM used, in conjunction with stakeholders to assess and implement mitigation measures for a threatened municipal water supply source. WSP monitors groundwater at this site semi-annually using low-flow techniques (bladder pump) and passive diffusion bag samplers. Supported design and implementation of supplemental groundwater investigations to assess emerging contaminants of concern: 1,4-dioxane and PFAS. WSP supports EGLE's continued assessment and mitigation of the volatilization to indoor air pathway (VIAP) near the former manufacturing property and above the downgradient extent of the groundwater TCE plume. Responsible for working with commercial and residential property owners and the Health Department to install sub-slab vapor pins and nested exterior soil vapor monitoring points to assess the TCE vapor plume. Work led to paired, seasonal indoor air and sub-slab soil vapor sample collection and the installation of three sub-slab depressurization systems (SSDSs) to address the VIAP. WSP provides EGLE with ongoing technical and public/stakeholder outreach support for this high-profile Site. Responsible for working with the EGLE project manager to present technical data and CSM at public stakeholder meetings (typically 1-2 times per year) and to support development of project specific "Fact Sheets". WSP maintains a publicly available Arcview-based geographic information system website that incorporates local parcel information, aerial imagery and documents groundwater results included in the annual monitoring reports.

Geophysicist/Hydrogeologist; DTMB Part 201/CERCLA Spartan Chemical; Wyoming, MI (2010 - ongoing). Designed and implemented offsite geophysical (resistivity) survey to support offsite

remedial investigation related to vapor intrusion and groundwater; pilot test oversight. Project scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and insitu chemical oxidation (ISCO) bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A regulated materials survey, geotechnical investigation, and waste characterization sampling were completed, and multiple monitoring wells were abandoned in preparation for the full-scale soil excavation work. WSP will provide construction oversight on behalf of EGLE during the full-scale soil excavation.

Lead Hydrogeologist; EGLE Part 201 Former Alpena Hide and Leather, Alpena, MI (2015 – ongoing). Responsible for design and implementation of a phased remedial investigation (RI) at this former tannery site that included geophysical surveys (frequency domain electromagnetics [EM-31], ground penetrating radar and down hole gamma logging); direct push boring/well installs; bedrock wireline coring and abandonment; test pitting; pore, storm, and surface water sample collection. RI activities included delineation of metals-related impacts in soil and groundwater and assessment of potential migration into and along historic tannery and municipal storm water utility infrastructure. Storm water infrastructure was assessed using combinations of survey, historical document searches, geophysical methods and remote vehicle surveys and the historical infrastructure at the tannery was shown to be connected to the municipal system that drains to the Thunder Bay River. Site characterization activities included assessment of hexavalent chromium in soil and groundwater.

Responsible for the development of the CSM for use in a focused FS to address metals (arsenic and lead) and buried hides at the Site. Arsenic impacts and buried hides were subsequently **excavated** as part of two interim response measures. Supported WSP and EGLE toxicologists to develop site-specific criteria for lead and arsenic, which included development and implementation of an in-vivo bioavailability assessment.

In 2017 PFAS were identified in Site soil and groundwater. Technical lead responsible for PFAS characterization in soil, groundwater and surface water, assessment of the fate and transport of PFAS via groundwater into stormwater and the Thunder Bay River, CSM development and pilot test design and implementation. In 2017 led efforts to perform a PFAS immobilization bench top study that were followed by 2018 injection and soil mixing pilot tests to address PFAS using bioavailable absorbent media (BAMTM), a biochar product. In 2020 worked with a biotech start-up to perform a novel PFAS microbial bench top study leading to bioaugmentation and biostimulation pilot tests to biotransform PFAS precursors and destroy PFAS in groundwater. Biostimulation has included solar-powered air sparge, oxygen release compound and electrochemical hydrolysis. Worked with remediation subcontractors and led

WSP that **designed** and implemented the first **TreeWell**<sup>®</sup>, capture and treat **phytoremediation pilot test** to address PFAS in North America in 2022 and worked with **risk assessors and biologists to assess PFAS uptake into tree tissue** (Results are pending). Provided hydraulic design support for installation of a focused paved "cap" to reduce PFAS leaching to groundwater from vadose soil and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors and support **property redevelopment**. Continues to support optimized performance monitoring/ long-term PFAS sampling program at the Site.

Technical Lead – RI/CSM; Confidential Client, Chemical Production, Storage and Packaging Facility; Danville, IL (2017 - ongoing). Technical lead of supplemental investigation to characterize extent of residual carbon tetrachloride contamination, including free product, using laser induced fluorescence (LIF) technologies and develop CSM to support additional design investigation, benchtop testing and feasibility study. Supported hydraulic assessment of phyto-based downgradient controls and their continued operation, monitoring and maintenance (OM&M). Benchtop testing ruled out feasibility of zero valent iron (ZVI). Selected remedy to remove free product from the source area and control residual carbon tetrachloride contamination in groundwater was electrical resistive heating (ERH) supplemented with downgradient containment via TreeWells®. Supported construction oversight and worked with the primary ERH contractor and our engineering team, to monitor improve ERH operational efficiencies to achieve heating objectives. This project was developed in accordance with an Illinois EPA approved RAP for the mass reduction of approximately 225,000 pounds of carbon tetrachloride, and other chemicals, across approximately one acre to a depth of up to 31 feet at this active chemical facility. The ERH system utilized electrical resistive heating collocated with vertical SVE wells with additional horizontal SVE network, all overlain with an insulative vapor barrier.

Hydrogeologic Lead; EGLE Part 201, Broadway Coin Laundry, Ann Arbor, MI (2017 – ongoing). Work is being performed to support **brownfield redevelopment** of this former dry cleaner property. Designed and implemented a series of geophysical profiles (resistivity/IP profiles) on- and offsite to define potential preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt and focus downgradient VAS locations. Coordinated RI to assess PCE impacts to soil, soil vapor and groundwater beneath and downgradient of the site with developer's consultant. VAS and monitoring wells were installed using rotosonic techniques to provide return/overcome cobble/boulder lenses near the source area. Provided EGLE third party review of FFS to address source impacts; leading to expanded in-situ remedy on property and more robust carbon-ZVI permeable reactive barrier (PRB) at the downgradient property boundary. Offsite RI supported assessment of VIAP and GSI pathway. Developed CSM that indicated offsite PCE impacts in low permeability material act as a secondary source of contamination completing the VIAP at downgradient apartments and pore and surface water sample collection demonstrates the plume discharges to surface water (Traver Creek and Huron River). WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Worked with remediation subcontractor to design additional PRB pilot tests using injectable PlumeStop™ and sulfonated ZVI (SM-ZVI) to reduce residual offsite PCE sources and the groundwater flux below the buildings (up to 99% reductions in PCE and related daughter products). WSP deployed passive flux meters to support PRB design. Provided senior

oversight during **pilot test injections** and subsequent performance OM&M evaluation. WSP is supporting EGLE with additional downgradient VIAP and GSI assessments and evaluating potential additional downgradient PRB pilot tests.

Senior Technical Support and Review; EGLE Part 201, Telecraft Shopping Center, Redford, MI (2017 - ongoing). WSP reviewed project deliverables and developed project approaches. Supported CSM development and WSP conducted a soil, groundwater, and soil gas investigation of a PCE plume associated with this former dry cleaner operation. Shallow PCE groundwater impacts were found to extend offsite toward a downgradient residential apartment complex. Evaluation of the VIAP (quarterly) related to shallow groundwater and potential migration via utility corridors (sewer vapor assessment) on the adjacent residential apartment complex is ongoing. The Rouge River is located approximately 1,000-feet downgradient of the Site. To assess CSI pathway, contaminant fate and transport was assessed for possible migration to the Rouge River via groundwater and storm water, which included detailed groundwater elevation/sewer elevation mapping and a camera survey within the sewer lines. Soil, groundwater, and soil vapor data collected is currently being evaluated by the project team for use in preparation of an FFS. Provide technical support to assess potential mitigation of this pathway via installation of a PRB and/or focused contaminant mass reduction in the source area as part of the FFS.

Senior Technical Support and Review; ECLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 - ongoing). Provided technical support to investigate light nonaqueous phase liquid in the subsurface and assess product mobility/migration and to utility corridors and sumps in residential brownfield project buildings constructed previously over this unlicensed former landfill. There have been occurrences of free product in some of the building basement sumps and there have been odors described as oil or solvent odors and sub-slab vapor extraction systems were installed. WSP was hired to conduct a supplemental investigation of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, install and sample sub slab vapor pins, and inspect and seal cracks and joints in the basements. Supported development of investigation scope that included potential use of LIF and sewer inspections. WSP inspected the adjacent stormwater sewer system using sewer cameras to evaluate the potential that contaminated groundwater and/or product is entering the sewer system and being discharged to an onsite detention basin. Following the inspection, the sewer was cleaned by jetting. WSP then developed design specifications for dredging the detention basin to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided construction oversight of the contractor on behalf of EGLE.

Senior Technical Review; EGLE Part 201, Michner Plating, Jackson, MI (2018 – ongoing). Provided technical support for CSM development, with emphasis on the assessment of the VIAP and GSI pathways on neighboring residential properties for this former plating facility adjacent to the Grand River. Scope involves conducting Phase I &II Environmental Site Assessments, and a Regulated Material Survey (RMS). The Phase I included review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. Soil vapor sampling within structures near the Site resulted in the installation of two vapor mitigation systems in nearby residences. Groundwater analytical results indicated the presence of **PFAS.** As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. The RMS included **asbestos, lead-based paint sampling**, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical and petroleum-stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for the demolition of the Site building. Provided technical support for additional characterization of PFAS in building materials (concrete slab).

Senior Technical Support and Review; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 - ongoing). Provided utility inventory and assessment support, and review of soil, soil vapor and groundwater analytical results to prepare a scaled 3-dimensional CSM (EVS Model) to guide remedial decision making in support of brownfield redevelopment of this former dry-cleaning facility. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition, provisions for treatment of the water below the building (dewatered during removal activities) and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater onsite. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterized solvent impacts to soil and groundwater. Supported implementation of a site-wide soil gas survey, including offsite residential properties and adjacent commercial properties, following identification of offsite migration along a former sanitary sewer corridor (preferential migration pathway). Vapor mitigation systems were installed in nearby residences (crawl space systems) based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and performed additional soil-waste characterization that resulted in development of a "Contained Out" letter to limit both on- and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using a "real time" onsite portable gas chromatograph.

*Technical Lead; EGLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 – ongoing).* Technical lead for **data gap investigation** to address the source area and a **VIAP assessment** (current and future) to support **property redevelopment**. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. Responsible for CSM development and evaluation of PRB performance monitoring results, including treatment of **PFAS** in groundwater to protect storm water/groundwater surface interface. The soil vapor investigation included installation of sub-slab and shallow soil vapor monitoring points (sampled quarterly). Supported preparation of a waste **characterization investigation** of the soil and groundwater and an **FFS** to address the residual sources of hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater and stakeholder outreach support. WSP is currently completing a **bench study** to determine amendment mix ratios needed to reduce total and Toxicity Characteristic Leaching Procedure concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the in-situ remediation of soil and groundwater which may also include excavation.

Senior Technical Review; Former JB Sims Generating Station-Harbor Island, Grand Haven, MI (2022 – ongoing). WSP is contracted, under HDR Michigan, Inc, to support the restoration of the former JB Sims Generating Station located in Harbor Island, City of Grand Haven, Michigan. Harbor Island has been used for industrial purposes and waste disposal for over 100 years for city trash (unlined dump site/landfill), dredge materials, and coal ash from JB Sims Plant Units I & 2 impoundments among other previous industrial uses. WSP is responsible for the non-Coal Combustion Residuals (CCR) Constituents of Concern (primarily PFAS) investigation, remediation design and implementation to be able to restore the Site into recreational or other use identified by the City of Grand Haven. First step of the project included development of initial CSM based on available non-CCR data and identification of data gaps. Supporting Data Gap Investigation, which will include vertical aquifer profiling (VAP) to identify the dump site location and PFAS source(s) and follow up monitoring well installations and surface water sample collection from surface water bodies located within and adjacent to the site. Provide technical support during and following RI and during the feasibility study to compare remediation options, including in-situ approaches to address PFAS.

Hydrogeologist/Remediation Assessment Lead, Michigan Department of Military and Veterans Affairs, Camp Grayling, Grayling, MI. Supported Development of a work plan for initial characterization of PFAS associated with historical onsite firefighting training at the base's airfield. Work plan included assessment of groundwater extraction, ex-situ treatment and reinjection loop (operated to address low level tetrachloroethylene [PCE] release) followed by VAP and receptor-based sample collection. Supported WSP's work with the local health department and EGLE to install point entry treatment systems at impacted residences and conduct follow up effectiveness monitoring and testing. Worked with the base and REGENSIS to design and install an injected (direct push) PlumeStop® pilot test PRB to adsorb PFAS and PCE from groundwater. In 2022 (i.e., 4-years into the test), detected PFAS and PCE results downgradient of the PRB remain below drinking water and GSI criteria. In addition to traditional groundwater performance metrics, responsible for the addition of soil sample collection to the work plan that included PRB confirmation borings and collection of samples for visual and analytical (physical properties) media distribution assessment as well as hydraulic testing (slug tests) to assess the delivery of the treatment media to the target interval and the effect of the colloidal carbon particulate on aquifer permeability. Prepared tables, plots and hydraulic analyses to assess pilot test performance metrics and compare results to modeled adsorptive kinetic behavior of PFAS and PCE. Both PFAS and PCE are being successful removed from groundwater by the PRB and pilot test results are being used in a pending FS to address ongoing PFAS migration away from the source.

# Justin Gal, PE, Senior Engineer

Roles/Responsibilities: Engineering, Construction Oversight, O&M	
Years of Experience: 18	<b>Education</b> : B.S, Civil and Environmental Engineering, 2004
Direct Employee, Novi, MI	<b>Registrations/Certifications:</b> Professional Engineer, MI, 2009

### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

Senior Engineer; Confidential Client, Detroit Refinery, Detroit, MI (2002 – ongoing). Responsible for FS, design, and engineering support during construction of a LNAPL, DNAPL, and groundwater containment system. Also responsible for remedial design of a soil cap. Environmental services to design and implement response measures to mitigate a 12-acre former coal tar refinery site with free product, groundwater, and soil contamination from coal tar refining wastes migrating toward the Rouge River. Conducted extensive upland investigation, including the use of a laser induced fluorescence (LIF) technology (*TarGost®*). Conducted a regulated materials survey (RMS) and lead-based paint sampling in preparation for building demolition. Responsible for the remedial design to mitigate contaminated groundwater migration to the Rouge River. Design elements included ~2,600 LF of sheet pile wall with sealed joints down to ~85 feet bgs, jet grout wall containment, groundwater treatment system. WSP provided construction oversight during construction of the groundwater treatment system, building and AST demolition and utility reconfiguration. WSP is providing operation and maintenance of the treatment system.

Senior Engineer; EGLE Part 201 Cal's Car Care, Northville, MI (2008 - ongoing). Project recognized as a redevelopment "Success Story" by the EGLE. Mr. Gal supported technical aspects of the remedial investigation and was the engineering lead for the focused feasibility study and design work on the project. WSP designed and directed a multi-phase groundwater, soil, soil gas, and indoor air remedial investigation involving commingled releases from leaking underground petroleum storage tanks and a former dry-cleaning business. Identified onsite source areas using passive soil vapor sampling. Planned and implemented multi-phased vapor intrusion assessments at neighboring properties, including the City's municipal offices plus several commercial and residential properties. Assessments involved comparison of groundwater samples to rapidly evolving vapor intrusion screening levels, installation of exterior soil gas monitoring points, analysis of sub-slab soil gas, and indoor air sampling. Coordinated field sampling with brownfield redevelopment activities. Investigation results used by developer to include passive vapor mitigation system (VMS) in construction plans. When post-installation indoor air samples showed passive VMS not performing as intended, conducted a **focused feasibility study** to evaluate potential VMS options. WSP designed recommended modifications, provided construction oversight of the improvements, and conducted performance monitoring to evaluate effectiveness.

# Senior Engineer; MDNR Part 201 Former Rose Lake Shooting Range, Bath, MI (2009–2019).

Responsible for **bench study**, **pilot study**, and **feasibility study** of the 30+ acre former skeet/trap shooting range located within a State Game Area that has a wide and deep lead shot

pattern and overlaps over 5 acres of wetlands. During the RI, assisted the selection of decision units for multi-incremental sampling investigation, completed sampling, and completed lead stabilization treatability study. Approximately 80 samples were collected from down range areas and analyzed for total lead, and a limited number of samples for TCLP lead. The extent of lead impacted soils was defined using generic Part 201 cleanup criteria. Most of the shot fall zone lies within a scrub/shrub wetland. Site ecological and human health risks to lead exposure are being evaluated using site specific information. A Baseline Ecological Risk Study was conducted to assess the lead exposure to small mammals, invertebrates, and the overall effect on the food chain. For the FS, completed a technology evaluation for 11.5 acres that were selected based on multi-incremental sampling results. Based on site-specific ecological based screening levels, minimized remedial footprint using multi-incremental sampling methods, prepared cost estimates, evaluated technologies for a variety of general remedial responses (e.g., containment, in-situ stabilization, and removal solutions), and conducted several regulatory meetings with MDNR and EGLE wetland permitting officers to select a soil relocation option where impacted soils would potentially be reused for berms at a 200-yardlong shooting range if soils are rendered non-hazardous. Soil relocation option is expected to significantly reduce otherwise expensive disposal costs and dramatically increase sustainability options for similar impacted skeet ranges undergoing remedial evaluations.

Senior Engineer; Confidential Client, Lower Rouge River-Old Channel, Detroit, MI (2010ongoing). Responsible for lead technical review of **RI/FS**, remedial design, design specifications, and construction oversight during installation of sheet pile wall that was completed per Project Agreement and approved by GLNPO. Scope of work includes sediment and porewater sampling, hydrographic surveys, and use of **LIF** technologies (TarGost®, UVOST®) to identify possible upland sources and potential in river sources consisting of **free product** to support **river restoration** efforts. **Remedial design** and construction elements included ~2,600 LF of sheet pile wall and coordinating the work across multiple effected properties. Mr. Gal provided senior review of the **feasibility study** and led several components of the **remedial design** and engineering services during **construction oversight**. A remedial design was completed by WSP, followed by **construction oversight** of riverbank restoration.

Senior Engineer; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010 – ongoing). Responsible for engineering tasks during investigations, bench, and pilot studies; remedial design, and engineering support during construction oversight. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and insitu chemical oxidation (ISCO) bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A regulated materials survey,

**geotechnical investigation,** and **waste characterization sampling** were completed, and multiple monitoring **wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** for EGLE during the full-scale soil excavation.

Senior Engineer; EGLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2010 - ongoing). Responsible for engineering tasks during the project investigation, FS, and remedial design. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Conceptual Site Model (CSM) and conducted a subsequent data gap investigation to support remedial design, PRB performance monitoring plan and VIAP assessment work plan to address residual hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a focused feasibility study to address the residual source and provided stakeholder outreach support and PRB operation, monitoring, and maintenance (OM&M) in support of EGLE. WSP developed design bid specifications for the demolition of the Site building which was funded through a **Brownfield Redevelopment** Grant. WSP completed an **RMS** as part of the predesign investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted construction oversight during the demolition. After the building was demolished, WSP conducted a waste characterization **investigation** of the soil and groundwater. WSP is currently completing a **bench study** to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for in-situ remediation of soil and groundwater which may also include excavation.

Senior Engineer; EGLE Part 201, Marshall Iron and Metal, Marshall, MI (2015 - ongoing). Responsible for remedial investigation planning and scope preparation, feasibility study, remedial design, and engineering support during construction oversight of an excavation and an in-situ remedy for mobile and migrating LNAPL at the site. WSP conducted an investigation which included LIF to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP prepared design bid documents for soil excavation and removal of NAPL, transportation, disposal to an approved landfill, backfill, and site restoration. WSP assisted EGLE in procuring a trade contractor and provided construction oversight during construction activities. WSP collected verification samples for laboratory analyses. Upon completion of the excavation activities, WSP prepared a construction report summarizing the activities. WSP completed an offsite investigation and determined NAPL extended to the adjacent property. WSP developed a feasibility study which recommended an in-situ enhanced bio-remediation remedy using BOS®200 to remediate the offsite property. WSP conducted a pilot study, developed bis specifications, and assisted EGLE with contractor procurement. WSP conducted contractor oversight of the In-situ remedy and is currently collecting groundwater samples to monitor

the performance. In addition, WSP conducted **soil gas survey** of the offsite building. WSP installed soil vapor pins in the building. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Senior Engineer; EGLE Part 201, Broadway Coin Laundry, Ann Arbor, MI (2017 – ongoing). Supporting brownfield redevelopment of this former dry cleaner property. Designed and implemented a series of geophysical profiles (resistivity/IP profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. Geophysical results used to focus downgradient vertical aquifer sampling (VAS) locations. Coordinated project team throughout remedial investigation to assess tetrachloroethylene (PCE) impacts to soil, soil gas and groundwater beneath and downgradient of the site. Obtained property access and soil permits for on- and offsite sampling. To assess GSI risk, contaminant fate and transport was assessed for possible migration into nearby water bodies (Taver Creek and Huron River) and the shallow and deep groundwater systems. VAS borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Organized field efforts to redevelop existing groundwater monitoring wells, install additional monitoring wells using sonic drilling, and sample the wells to further analyze the contamination extent. Conducted pilot testing using **PlumeStop™**. Conducted engineering evaluations and oversight of pilot testing being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess performance of the pilot study and evaluate potential additional downgradient investigation and remediation.

Senior Engineer; EGLE Part 201, Hensley Property, Marshall, MI (2017 - ongoing). Responsible for feasibility study, pilot study, and design of this brownfield redevelopment project. WSP conducted a limited investigation which included use of LIF to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP developed a feasibility study which recommended an In-situ enhanced bio-remediation remedy using BOS®200 to remediate the property. WSP conducted a pilot study, developed design bid specifications, and assisted EGLE with contractor procurement. WSP conducted contractor oversight of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP completed a vapor intrusion investigation by installing soil vapor points and collecting soil gas samples. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Senior Engineer; Confidential Client, Chemical Production, Storage and Packaging Facility; Danville, IL (2017 - ongoing). Provided technical review for development of CSM in support of feasibility study and subsequent remedial design for remedy to remove free product from the source area and control residual carbon tetrachloride contamination in groundwater. Selected remedy was electrical resistive heating (ERH). Developed remedial design, drawings, and bid package. Provided construction oversight, including review of contractor submittals. Worked with the primary ERH contractor, hazardous waste contractor, and other lower tier subcontractors to coordinate and facilitate the success of the project. This project was developed in accordance with an Indiana EPA approved RAP for the **mass reduction of approximately 225,000 pounds** of carbon tetrachloride, and other chemicals, across approximately one acre to a depth of up to 31 feet at this active chemical facility. The RRH system utilized ERH collocated with vertical SVE wells with additional horizontal SVE network, all overlain with an insulative vapor barrier.

Senior Engineer; Confidential Landfill, MI (2018 – ongoing). Responsible for engineering tasks during a pilot study, remedial design, and construction oversight. Samples from the onsite groundwater treatment system showed PFOS and PFOA above USEPA health advisory levels and above Michigan health-based drinking water values. To evaluate potential PFAS treatment upgrades for the system, WSP designed, constructed, and operated an onsite PFAS Treatment Column Study that demonstrated the effectiveness of GAC and non-regenerable IX resin. WSP designed the groundwater treatment system and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 140 gallons per minute, consisting of 3 x 70-cubic feet ion-exchange resin vessels for PFAS removal, an air stripper for VOC removal, and a deposit control and solids management system to maximize system uptime. The design also included the treatment system building and the controls system to remotely monitor the system. WSP is providing construction oversight of the modifications. Once the system is constructed, WSP will provide operation and maintenance services for our client.

Senior Engineer; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 ongoing). Responsible for remedial design and engineering support during construction oversight. WSP reviewed project deliverables and developed of project approaches in support of brownfield redevelopment. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

Senior Project Engineer; ECLE Part 201, Michner Plating, Jackson, MI (2018 – ongoing). Responsible for the senior review the building demolition bid specifications for this former plating facility adjacent to the Grand River. Scope involves conducting Phase I &II Environmental Site Assessments, and an RMS. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical and petroleum-stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of **PFAS.** As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the **installation of two vapor mitigation** systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

## Senior Engineer, AFCEC BRAC Midwest BECOS Remedial Action, Former Wurtsmith Air Force Base (AFB); Sub to LCES JV (2021-ongoing). Responsible for remedial design of groundwater pump and treat system optimizations, remedial design for one new groundwater pump and treat PFAS remediation system, and engineering support during system operation and maintenance activities for three groundwater pump and treat systems and one engineered wetland treatment system for landfill leachate. As part of the RA-O and LTM activities, WSP is currently operating, maintaining, and monitoring three groundwater pump and treat systems for PFAS. Groundwater treatment technologies include ion exchange resin and granular activated carbon. Provides technical reviews if documents including a Programwide QAPP and Health and Safety Plan. As senior engineer responsible for overseeing the technical aspects of the treatment operations, design modifications, optimize uptime of existing process equipment, and technical review of monthly and annual reports.

Senior Technical Review; Former JB Sims Generating Station-Harbor Island, Grand Haven, MI (2022 – ongoing). Responsible for engineering tasks during the project **Data Gap Investigation**. WSP is contracted, under HDR Michigan, Inc, to support the restoration of the former JB Sims Generating Station located in Harbor Island, City of Grand Haven, Michigan. Harbor Island has been used for industrial purposes and waste disposal for over 100 years for city trash (unlined dump site/landfill), dredge materials, and coal ash from JB Sims Plant Units 1
& 2 impoundments among other previous industrial uses. WSP is responsible for the non-Coal Combustion Residuals (CCR) Constituents of Concern (**primarily PFAS**) investigation, remediation design and implementation to be able to restore the Site into recreational or other use identified by the City of Grand Haven. First step of the project included development of initial CSM based on available non-CCR data and identification of data gaps. Supporting **Data Gap Investigation**, which will include vertical aquifer profiling to identify the dump site location and **PFAS source(s)** and follow up monitoring well installations and surface water sample collection from surface water bodies located within and adjacent to the site. During our next phase of work, Mr. Gal will be our lead technical resource, including the engineering lead for the **feasibility study** to compare remediation options. Pending funding and completion of our feasibility study, remediation will be implemented to support **Harbor Island Restoration** activities and **brownfield redevelopment** plans for the property.

# Jeshua Hansen, PE, CP, Senior Engineer

Roles/Responsibilities: Engineering		
Years of Experience: 22	Education: B.S., Science/Agricultural Engineering, 2000;	
	MS, Environmental Engineering, 2012	
Direct Employee, Novi, MI	Registrations/Certifications: Professional Engineer, 2005, MI,	
	6201052695; Professional Engineer, 2005, IL, 062.058617;	
	Professional Engineer, 2013, OH, 77570; Certified Class K	
	Industrial Wastewater Treatment Works Operator, 2002, IL;	
	Certified Industrial Commercial Waste Water Operator, 2008,	
	MI, W6350; Certified Underground Storage Tank Professional,	
	2009, MI, 1129; Certified Storm Water Operator Construction	
	Site, 2010, MI, C-15323; Soil Erosion and Sedimentation Control	
	Inspector, 2010, MI, I-10-0487	

RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

Relevant Experience

# Senior Engineer; Confidential Client; Detroit Refinery, Detroit, MI (2002 - ongoing).

Responsible for engineering aspects of the project, including preparation of a **detailed design** and bid package. Environmental services to design and implement response measures to mitigate a 12-acre former coal tar refinery site with **free product**, groundwater and soil contamination from coal tar refining wastes (VOCs, SVOCs, metals, and NAPL) migrating toward the Rouge River. Conducted extensive upland investigation, including the use of a **laser induced fluorescence (LIF)** technology (*TarGost®*). Conducted a **regulated materials survey** and **lead-based paint sampling** in preparation for building demolition. Developed a **remedial design** to mitigate contaminated groundwater migration to the Rouge River. Developed specifications for demolition of a **one million gallon above ground storage tank** (**AST**) and disposal of hazardous waste. Designed the **reconfiguration of site utilities** (power, water, and gas), conducted a **vapor intrusion study** and **abandoned monitoring wells** in preparation **for brownfield redevelopment**. WSP provided **construction oversight** during construction of the groundwater capture and treatment system, building and AST demolition and utility reconfiguration. WSP is providing **operation and maintenance** of the groundwater capture and treatment system.

Senior Engineer; EGLE Part 201, Harbor Plating Facility, Benton Harbor, MI (2005 – ongoing). Responsible for the construction oversight and operation and maintenance of a remediation system at an abandoned chrome and cadmium plating facility. Various soil and groundwater investigations were conducted and determined that a 1,600-foot-long chromium and TCE contaminated groundwater plume emanated from this former plating facility and was discharging to nearby creeks. The chromium contamination was determined to be both a RCRA Listed and Characteristically hazardous waste by the USEPA and EGLE. A feasibility study showed the best remedial alternative to protect the creeks was groundwater capture and treatment using an iron co-precipitation process to remove the chromium, followed by a granulated activated carbon polish. A remedial design of the system was completed, and the system was constructed with WSP providing construction oversight. The specifications included soil erosion and sedimentation controls, repairs/modifications of an existing building to house the treatment system, a Unipure<sup>™</sup> treatment system, and groundwater collection trenches with pneumatic pumps, directional drilling of water transport pipes and air lines for the pumps, and site restoration. Since system construction, WSP has been providing system **operation and maintenance**. Conducted a groundwater **PFAS investigation** to characterize site groundwater.

Senior Engineer; Confidential Client, Lower Rouge River-Old Channel, Detroit, MI (2010ongoing). Technical Lead in the preparation of the RI/FS. The RI/FS scope of work included sediment and porewater sampling, hydrographic surveys, and use of LIF technologies (TarGost®, UVOST®) to identify possible upland sources and potential in river sources consisting of free product to support river restoration efforts. An FS was completed in partnership with the USEPA Great Lakes National Program Office, selecting a remedy consisting of structural 2,500 feet long steel sheet pile wall (to depth of up to 95 feet) to support a combination of sediment capping and dredging of approximately 70,000 CY of sediment. A remedial design was completed by WSP, followed by construction oversight of riverbank restoration work.

## Senior Engineer; DTMB Part 201/CERCLA Spartan Chemical; Wyoming, MI (2010 -

ongoing). Responsible for engineering aspects of this project, including conducting an AS/SVE pilot study, design of full-scale AS/SVE system, including design specifications and drawings. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in a residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, an air sparge/soil vapor extraction (AS/SVE) pilot study, and in-situ chemical oxidation (ISCO) bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of Enviroblend™ to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A regulated materials survey, geotechnical investigation, and waste characterization sampling were completed, and multiple monitoring wells were abandoned in preparation for the full-scale soil excavation work. WSP will provide construction oversight on behalf of EGLE during the fullscale soil excavation.

Senior Engineer; Confidential Client, Kalamazoo River Superfund Site, MI (2013 – ongoing). Senior Engineer responsible for conceptual site model development and feasibility study in one sub-reach and remedial design and construction oversight in two sub-reaches. Primary contaminant is PCBs in sediment and floodplain soil. Investigation work included hydrographic surveys, sediment and soil sampling, fish collection and tissue analysis, geotechnical investigation and the evaluation of remedial alternatives involving dredging sediment capping and natural recovery. Working with risk assessors and statisticians within WSP, USEPA and EGLE (and their consultants) to evaluate river ecosystem restoration, including decreasing PCB concentrations in fish tissue. WSP completed two remedial designs for two sub-reaches of the river, followed by construction oversight during removal of a dam water control structure, sediment dredging, **stream bank restoration**, and **wetland restoration**. In one of the sub-reaches, sediment **PFAS remediation** of a side channel required **PFAS sampling, waste characterization sampling**, and water treatment system design.

Senior Engineer, Confidential Client, Chemical Production, Storage and Packaging Facility; Danville, IL. Design lead for development of conceptual site model in support of feasibility study and subsequent remedial design for remedy to remove free product from the source area and control residual carbon tetrachloride contamination in groundwater. Selected remedy was electrical resistive heating (ERH). Developed remedial design, drawings, and bid package. Provided construction oversight, including review of contractor submittals. Worked with the primary ERH contractor, hazardous waste contractor, and other lower tier subcontractors to coordinate and facilitate the success of the project. This project was developed in accordance with an Illinois EPA approved RAP for the mass reduction of approximately 225,000 pounds of carbon tetrachloride, and other chemicals, across approximately one acre to a depth of up to 31 feet at this active chemical facility. The ERH system utilized electrical resistive heating collocated with vertical SVE wells with additional horizontal SVE network, all overlain with an insulative vapor barrier.

# Deanna Hutsell, PE, Senior Engineer

Roles/Responsibilities: Engineering		
Years of Experience: 20	Education: BS, Environmental Engineering, 2002	
Direct Employee, Novi, MI	<b>Registrations/Certifications:</b> Professional Engineer, 2008	

### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

### Relevant Experience

# Project Engineer; EGLE Cal's Car Care, Vapor Intrusion Assessment and Mitigation,

*Northville, MI (2008 - ongoing).* Worked with project team to troubleshoot passive vapor mitigation system and convert to active mitigation. WSP designed and directed a multi-phase groundwater, soil, soil gas, and indoor air **remedial investigation** involving commingled releases from leaking underground petroleum storage tanks and a former dry-cleaning business. Identified onsite source areas using passive soil vapor sampling. Planned and implemented multi-phased **vapor intrusion assessments** at neighboring properties, including the City's municipal offices plus several commercial and residential properties. Assessments involved comparison of groundwater samples to rapidly evolving vapor intrusion screening levels, installation of exterior soil gas monitoring points, analysis of sub-slab soil gas, and indoor air sampling. Coordinated field sampling with **brownfield redevelopment** activities. Investigation results used by developer to include passive **vapor mitigation system** (VMS) in construction plans. When post-installation indoor air samples showed passive VMS not performing as intended, conducted a **focused feasibility study** to evaluate potential VMS options. WSP **designed** recommended modifications, provided **construction oversight** of the improvements, and conducted performance monitoring to evaluate effectiveness.

Project Engineer; DTMB Part 201/CERCLA Spartan Chemical; Wyoming, MI (2010 -

ongoing). Responsible for coordination of project field activities, preparation of project planning documents and reporting. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and in-situ chemical oxidation (ISCO) bench and pilot studies. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of Enviroblend<sup>™</sup> to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of design specifications and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. A regulated materials survey, geotechnical investigation, and waste characterization sampling were completed, and multiple monitoring wells were

**abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

Project Engineer; EGLE Part 201, Broadway Coin Laundry, Ann Arbor, MI (2017 – ongoing). Responsibilities included coordinating with project team throughout RI to assess tetrachloroethylene (PCE) impacts to soil, soil gas and groundwater beneath and downgradient of the site. WSP supported brownfield redevelopment of this former dry cleaner property. Designed and implemented a series of geophysical profiles (resistivity/IP profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. Geophysical results used to focus downgradient vertical aquifer sampling (VAS) locations. Coordinated project team throughout remedial investigation to assess tetrachloroethylene (PCE) impacts to soil, soil gas and groundwater beneath and downgradient of the site. To assess GSI risk, contaminant fate and transport was assessed for possible migration into nearby water bodies (Taver Creek and Huron River) and the shallow and deep groundwater systems. VAS borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Organized field efforts to redevelop existing groundwater monitoring wells, install additional monitoring wells using sonic drilling, and sample the wells to further analyze the contamination extent. Conducted pilot testing using **PlumeStop<sup>M</sup>**. Conducted engineering evaluations and oversight of **pilot testing** being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess performance of the pilot study.

Project Engineer; EGLE Part 201, Telecraft Shopping Center, Redford, MI 2017 - ongoing).

Responsible for coordination of field activities and preparation of technical reports documenting analytical results. WSP reviewed project deliverables and developed project approaches. WSP conducted a soil, groundwater, and **soil gas investigation** of a tetrachloroethylene (PCE) plume associated with a former dry cleaner, which extends beneath a residential apartment complex, located immediately downgradient of the Site. Additionally, the Rouge River is located approximately 1,000-feet downgradient of the Site. To assess GSI risk, contaminant fate and transport was assessed for possible migration to the Rouge River. Evaluation of the vapor intrusion pathway related to shallow groundwater on the adjacent apartment complex is ongoing, as well as quarterly groundwater and soil vapor sampling. Additional assessment of the soil vapor was conducted at the apartment complex by completing vapor sampling and a **camera survey within the sewer lines.** Soil, groundwater, and soil vapor data is being evaluated for use in preparation of a focused **feasibility study**.

*Project Engineer; EGLE Part 201, Michner Plating, Jackson, MI (2018 – ongoing).* Responsible for coordination of soil, groundwater, soil vapor, and indoor air sampling associated with this former plating facility adjacent to the Grand River. Scope involves conducting **Phase I &II Environmental Site Assessments**, and a **Regulated Material Survey (RMS)**. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical- and petroleum-stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of PFAS. As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the installation of two vapor mitigation systems in nearby residences.

## Project Engineer; ECLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 -

ongoing). Responsible for development of sampling program and coordination of field activities, developing remedial cost estimates, completion of specifications for remediation that included soil excavation and dewatering activities, and oversight during construction activities. WSP reviewed project deliverables and developed of project approaches in support of brownfield redevelopment. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

# *Jeff Lively, CSP, RRPT – Senior Associate Health Physicist*

Roles/Responsibilities: Engineering		
<b>Years of Experience:</b> 45 (26 Years with WSP)	Education: Naval Nuclear Power Program, 12/1977-12/1988	
Direct Employee, Grand Junction, CO	<b>Registrations/Certifications:</b> Certified Safety Professional (CSP) #15656; Registered Radiation Protection Technologist #13632	

### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

Senior Health Physicist, Dose-Assessor; Confidential Client, Nuclear Fuel Facility Demolition and Sitewide Remediation, Windsor, CT (1997 – 2018) FUSRAP Site Remediation and D&D. The WSP Team (formerly Wood Environment & Infrastructure Solutions) led the planning and development of end state closure strategy and negotiations with regulators under a complex regulatory framework as the site history and condition dictated the requirements of several environmental programs due to the widespread cleanup. WSP worked closely with the NRC, CTDEEP, USACE and EPA to achieve objectives for unrestricted release of 600-acre property for transfer and mixed-use redevelopment. WSP excavated radiologically contaminated soil and sediment; conducted D&D of structures; waste transportation and disposal; and site restoration. Mr. Lively was instrumental in working with the client and regulators to plan, implement, and execute remediation strategies for closure, and verify remediation to demonstrate compliance with cleanup criteria. He supported development and implementation of the RPP; reviewed work plans to ensure proper radiation hazard controls, instrumentation, and personnel training requirements were addressed; managed MARSSIM-based feasibility study (statistical sampling) and dose-modeling for human health risk/dose assessment to develop radiological dose-based cleanup criteria. He served as an SME to provide input to accelerate the schedule to excavate and ship rad-impacted soil from the five soil areas and the decommissioning and demolition to take advantage of reduced disposal prices offered by the receiving facility - saved our client over \$2 million. Our remediation and compliance measurement work resulted in the site closure including termination of two NRCissued radioactive materials licenses and a voluntary RCRA cleanup under State-EPA jurisdiction in 2013 with no future use restrictions.

Senior Health Physicist; LLRW Excavation and Disposal Cell Cover Construction, Alameda, CA (2008 – 2018). WSP completed the radiological cleanup and closure of Site 1 to meet cleanup goals for recreational use at a closed Navy installation adjacent to the San Francisco Bay. We excavated waste from the former burn area and exposed beach areas; removed hazardous, toxic and rad-impacted soil and debris; managed waste segregation so that materials not meeting remediation goals were packaged and shipped off site, soils with concentrations below remediation goals were used onsite to construct the foundation of the waste isolation cover. Mr. Lively provided program oversight related to NRC License and State Radioactive Materials License; supported NAVFAC in addressing requirements of the Navy RASO and CDPH; and provided corporate and site support for implementation of RPP and site radiological controls. He supported the onsite Radiation Safety Officer to evaluate effectiveness of worker and environmental protection, directing safety and RP field staff to carry out radiological operations in **compliance with programs**, work plans, and SOPs. He interpreted data to support **radiological investigation, remediation, and waste management**).

Senior Health Physicist; USDOE Moab Uranium Mill Tailings Remedial Action, Moab, UT (2011-2021). WSP executed and maintained the ESH&Q programs at Moab and Crescent Junction and provided management and technical support for RRM excavation, conditioning, and filling of intermodal containers at the Moab site for transport to Crescent Junction via rail; disposal of LLRW in the Crescent Junction disposal facility; Crescent Junction landfill cell construction and cover; remediation of vicinity properties; and site restoration. Mr. Lively supervised Radiation Protection and Site Security staff on the project under subcontract to North Wind. His staff provided site access control and security functions as well as Radiation Protection Program and field support for all operations and activities at both the Moab and Crescent Junction sites.

Senior Health Physicist; LLRW Waste Remediation and Long-Term Waste Management Facility Construction, Port Granby, Ontario (2015 - ongoing). One of Canada's largest environmental remediation/restoration projects for the cleanup and long-term storage of historic low-level radioactive waste to protect human health and the environment. WSP is managing the excavation of historic LLRW (generated by the former El Dorado Nuclear Limited refinery in Port Hope) that was placed in trenches along the bluffs of Lake Ontario in the town of Port Granby. WSP completed the remedial excavation of the historical trenches and designed and implemented the radiological remedial action completion surveys, a key step in the closure process for the trenches site. WSP constructed the disposal impoundment and has safely excavated, transported, and placed nearly 1.3 million tons of LLRW in the landfill. The final cover has been installed as the final step in the closure process for the disposal impoundment. WSP worked nearly 730,000 hours without a lost time incident. Relevance: Mr. Lively designed the radiological gamma scan surveys using WSP's *ScanPlot*<sup>®M</sup> technology, developed the compliance metrics for assessing the data relative to the remedial objectives, and oversaw a team of radiological specialists performing analysis and reporting of the data as an element of the closure requirements to meet Canadian Nuclear Safety Commission requirements.

Principal; Michigan Department of Natural Resources, Tobico Marsh State Game Area Remediation and Radiological Services, Kawkawlin, MI (1995 - 2007). Served as project technical lead, radiological environmental engineer and was the primary author of Radiological Decommissioning Plan and Final Status Survey Report. WSP provided a variety of environmental services including NRC licensing and license termination (assessments and preparation of documentation), scoping surveys, site characterization, related radiological support services (including assessment of POTW sanitary sewer system), chemical investigation and leachate collection and treatment system design for remediation of 39 acres near Tobico Marsh State Game Area and habitat. Site of former landfill containing estimated 18,500 buried drums filled with chlorinated solvent and petroleum products; area also contained low-level radioactive magnesium-thorium slag. WSP also provided consulting services to state to meet NRC requirements for Site Decommissioning Management Plan (SDMP) site. The SDMP Radioactive Materials License issued to the State of Michigan by the NRC was terminated without the need for further remediation or institutional controls saving the MDNR millions of dollars and avoiding long-term ecological damage to the surrounding pristine and protected ecosystem.

# Nate Peck, PE, Senior Engineer

Roles/Responsibilities: Engineering		
Years of Experience: 10	Education: BS, Environmental Engineering, 2012	
Direct Employee, Traverse City, MI	<b>Registrations/Certifications:</b> Professional Engineer, Michigan 2019	

## RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

### **Relevant Experience**

Senior Engineer; EGLE Part 201 Wickes Manufacturing 5-Mile-Long TCE Plume; Mancelona, MI (2007 – ongoing). Responsible for development of design and bid specifications for vapor mitigation systems at three different buildings. The project scope also included conducting investigation [vertical aquifer sampling, geophysical surveys (seismic profiling, induced polarity and electrical resistivity, and down hole gamma logging) multiple drilling methods for deep monitoring well installations], community relations for TCE plume extending 5 miles from source area, affecting more than 1,200 properties. To date, 17 monitoring wells have been abandoned. WSP developed and support an interactive web-based GIS web page for displaying project details. WSP conducted feasibility study to evaluate in-situ technologies including in-situ chemical oxidation (ISCO) and enhanced in-situ bioremediation. Monitored natural attenuation approach is currently being taken due to technical constraints.

Project Engineer; EGLE Part 201, Michner Plating, Jackson, MI (2018 - ongoing). Responsible for developing bid item list and conceptual design for the building demolition bid package. WSP scope includes conducting Phase I &II Environmental Site Assessments, and an RMS. The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical and petroleum-stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of PFAS. As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed quarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the

**installation of two vapor mitigation** systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

*Project Engineer; Confidential Client; Detroit Refinery, Detroit, MI (2002 – ongoing).* Assisted with design of the groundwater collection and treatment system. Environmental services to design and implement response measures to mitigate a 12-acre former coal tar refinery site with **free product**, groundwater and soil contamination from coal tar refining wastes (VOCs, SVOCs, metals, and NAPL) migrating toward the Rouge River. Conducted extensive upland investigation, including the use of a **laser induced fluorescence (LIF)** technology (*TarCost®)*. Conducted a **regulated materials survey (RMS)** and **lead-based paint sampling** in preparation for building demolition. Developed a **remedial design** to mitigate contaminated groundwater migration to the Rouge River. Developed specifications for demolition of a **one-million-gallon above ground storage tank (AST)** and disposal of hazardous waste. Designed the **reconfiguration of site utilities** (power, water, and gas), conducted a **vapor intrusion study** and **abandoned monitoring wells** in preparation for brownfield redevelopment. WSP provided **construction oversight** during construction of the groundwater capture and treatment system, building and AST demolition and utility reconfiguration. WSP is providing **operation and maintenance** of the groundwater capture and treatment system.

Project Engineer; MDNR Part 201 Former Rose Lake Shooting Range, Bath, MI (2009–2019). Responsible for site characterization investigation, bench study, and feasibility study development. Assisted in development of project scope to characterize the extent of lead contamination at a former skeet/trap shooting range located within a State Game Area. Approximately 80 samples were collected from down range areas and analyzed for total lead, and a limited number of samples for TCLP lead. The extent of lead impacted soils was defined using generic Part 201 cleanup criteria. Most of the shot fall zone lies within a scrub/shrub wetland. Site ecological and human health risks to lead exposure are being evaluated using site-specific information. A Baseline Ecological Risk Study was conducted to assess the lead exposure to small mammals, invertebrates, and the overall effect on the food chain. For the FS, completed a technology evaluation for 11.5 acres that were selected based on multiincremental sampling results. Based on site-specific ecological based screening levels, minimized remedial footprint using multi-incremental sampling methods, prepared cost estimates, evaluated technologies for a variety of general remedial responses (e.g., containment, in-situ stabilization, and removal solutions), and conducted several regulatory meetings with MDNR and EGLE wetland permitting officers to select a soil relocation option where impacted soils would potentially be reused for berms at a 200-yard-long shooting range if soils are rendered non-hazardous. Soil relocation option is expected to significantly reduce otherwise expensive disposal costs and dramatically increase sustainability options for similar impacted skeet ranges undergoing remedial evaluations.

Senior Engineer; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010– ongoing). Responsible for remedial design and bid package development. Scope involves remedial investigation and design specifications at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, geophysical investigation in residential neighborhood, vapor intrusion investigation onsite and offsite (residential neighborhood, commercial and industrial properties, and a high school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) pilot study, and insitu chemical oxidation (ISCO) bench and **pilot studies**. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC adsorbing air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of **design specifications** and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. An **RMS, geotechnical investigation**, and **waste characterization sampling** were completed, and multiple monitoring **wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

Senior Engineer; EGLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2015 ongoing). Senior Engineer assisting with design and implementation of a phased remedial **investigation (RI)** at this former tannery site that included **geophysical surveys** (frequency domain electromagnetics [EM-31], ground penetrating radar and down hole gamma logging); direct push boring/well installs; bedrock wireline coring and abandonment; test pitting; pore, storm and surface water sample collection. RI activities included delineation of metals-related impacts in soil and groundwater and assessment of potential migration into and along historic tannery and municipal storm water utility infrastructure. Storm water infrastructure was assessed using combinations of survey, historical document searches, geophysical methods and remote vehicle surveys and the historical infrastructure at the tannery was shown to be connected to the municipal system that drains to the Thunder Bay River. Site characterization activities included assessment of hexavalent chromium in soil and groundwater. In 2020 worked with a biotech start-up to perform a novel **PFAS microbial bench top study** leading to bioaugmentation and biostimulation pilot tests to biotransform PFAS precursors and destroy PFAS in groundwater. Biostimulation has included solar-powered air sparge, oxygen release compound and electrochemical hydrolysis. Worked with remediation subcontractors and led WSP that designed and implemented the first TreeWell®, capture and treat phytoremediation pilot test to address PFAS in North America in 2022 and worked with risk assessors and biologists to assess PFAS uptake into tree tissue (Results are pending). Provided hydraulic design support for installation of a focused paved "cap" to reduce PFAS leaching to groundwater from vadose soil and designed and oversaw installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration to groundwater and surface water interface receptors and support property redevelopment. Continues to support optimized performance monitoring/long term PFAS sampling program at the Site.

Senior Engineer; EGLE Part 201, Marshall Iron and Metal, Marshall, MI (2015 - ongoing). Responsible for design and developed design bid specifications for remedial in-situ injections to address NAPL. WSP conducted an investigation which included LIF to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP prepared design bid documents for soil excavation and removal of NAPL, transportation, disposal to an approved landfill, backfill, and site restoration. WSP assisted EGLE in procuring a trade contractor and provided construction oversight during construction activities. WSP collected verification samples for laboratory analyses. Upon completion of the excavation activities, WSP prepared a construction report summarizing the activities. WSP completed an offsite investigation and determined NAPL extended to the adjacent property. WSP developed a **feasibility study** which recommended an in-situ enhanced bio-remediation remedy using BOS®200 to remediate the offsite property. WSP conducted a **pilot study**, developed bid specifications, and assisted EGLE with contractor procurement. WSP conducted **contractor oversight** of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP conducted **soil gas survey** of the offsite building. WSP installed soil vapor pins in the building. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Project Engineer; Confidential Client, Chemical Production, Storage and Packaging Facility; Danville, IL (2017 - ongoing). Provided construction oversight and technical support in support of feasibility study and subsequent remedial design for remedy to remove free product from the source area and control residual carbon tetrachloride contamination in groundwater. Selected remedy was electrical resistive heating (ERH). Developed remedial design, drawings, and bid package. Provided construction oversight, including review of contractor submittals. Worked with the primary ERH contractor, hazardous waste contractor, and other lower tier subcontractors to coordinate and facilitate the success of the project. This project was developed in accordance with an Illinois EPA approved RAP for the mass reduction of approximately 225,000 pounds of carbon tetrachloride, and other chemicals, across approximately one acre to a depth of up to 31 feet at this active chemical facility. The ERH system utilized electrical resistive heating collocated with vertical SVE wells with additional horizontal SVE network, all overlain with an insulative vapor barrier.

Senior Engineer; EGLE Part 201, Hensley Property, Marshall MI (2017 – ongoing). Responsible for development of design bid specifications of this brownfield redevelopment project. WSP conducted a limited investigation which included use of LIF to determine the extent of NAPL, and soil and groundwater sampling from direct push soil borings to determine extent of contamination. WSP developed a feasibility study which recommended an In-situ enhanced bio-remediation remedy using BOS®200 to remediate the property. WSP conducted a pilot study, developed design bid specifications, and assisted EGLE with contractor procurement. WSP conducted contractor oversight of the In-situ remedy and is currently collecting groundwater samples to monitor the performance. In addition, WSP completed a vapor intrusion investigation by installing soil vapor points and collecting soil gas samples. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended.

Senior Engineer; EGLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 – ongoing). Provided technical review of Work Plans. A condominium complex consisting of 10 buildings was developed as a **brownfield project** over this unlicensed former landfill. There have been occurrences of **free product** in some of the building basement sumps and odors described as oil or solvent odors and sub-slab vapor extraction systems were installed. WSP was hired to conduct an **investigation** of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, **install and sample sub slab vapor pins** and inspect and seal cracks and joints in the basements. WSP also inspected the adjacent stormwater sewer system using **sewer cameras** to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the **sewer was cleaned by jetting**. WSP then developed **design specifications** for **dredging the detention basin** to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided **construction oversight** of the contractor on behalf of EGLE.

Senior Engineer; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 – ongoing). Responsible for design and development of the design bid specifications for remedial soil mixing and excavation work and reviewed contractor submittals. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, leadbased paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition, provisions for treatment of the water in the building's basement to be dewatered during removal activities and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. WSP developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

# Senior Engineer, ECLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 - ongoing). Developed the Feasibility Study for remedial alternatives and responsible for the design and development of the **design bid specifications** for remedial soil mixing and excavation work and for the bid specifications of the building demolition. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Site CSM and conducted a subsequent **data gap investigation** to support **remedial design**, PRB performance monitoring plan and **VIAP assessment** work plan to address residual hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation of sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a **focused feasibility study** to address the residual source and provided stakeholder outreach support and PRB **operation, monitoring**, **and maintenance** in support of

EGLE. WSP developed **design bid specifications** for the demolition of the Site building. WSP completed an **RMS** as part of the pre-design investigation. The **RMS** included **asbestos**, **lead-based paint sampling**, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted **construction oversight** during the demolition. After the building was demolished, WSP conducted a waste **characterization investigation** of the soil and groundwater. WSP is currently completing a **bench study** to determine amendment mix ratios needed to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the in-situ remediation of soil and groundwater which may also include excavation.

# Lindsey Selvig, Environmental Engineer

Roles/Responsibilities: Engineering		
Years of Experience: 5	Education: BS, Environmental Engineer	
Direct Employee, Novi, MI	<b>Registrations/Certifications:</b> Michigan Asbestos Inspector, A51173 Michigan Certified Industrial Storm Water Operator, I-14924; 40-Hour HAZWOPER Training with annual updates; First Aid and CPR, American Red Cross	

### RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

#### Relevant Experience

Staff Engineer; EGLE Part 201, Michner Plating, Jackson, MI (2008 - ongoing). Responsibilities included data review and figure creation. Scope involves conducting Phase I & II Environmental Site Assessments, and a Regulated Material Survey (RMS). The Phase I including review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase II included installation of groundwater wells and sampling; soil sampling, installation of soil gas monitoring wells and soil gas sampling. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical- and petroleum-stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed bid specifications for the demolition of the Site building. Groundwater analytical results indicated the presence of PFAS. As a result, additional surface water sampling and monitoring well sampling for PFAS was conducted as well as a water well survey to identify potential receptors within one mile of the Site. WSP completed a remedial investigation on nearby commercial, industrial, and residential properties up to two city blocks from the Site. The investigation included the installation of eight onsite and 29 offsite permanent monitor wells and three onsite and 46 offsite soil vapor sampling points, including 13 vapor pins within commercial and residential buildings, to define the extent of the soil, groundwater and soil vapor plumes associated with the Site. WSP also completed guarterly sampling at the monitoring network associated with the Site to evaluate seasonal variability of contaminants in groundwater and soil vapor and to evaluate groundwater flow patterns. Soil vapor sampling within structures near the Site resulted in the installation of two vapor mitigation systems in nearby residences. WSP is currently evaluating expanding the soil vapor investigation to additional nearby residences.

### Staff Engineer; DTMB Part 201/CERCLA Spartan Chemical, Wyoming, MI (2010-

*ongoing).* Responsible for development of waste characterization work plan. Scope involves **remedial investigation** and **design specifications** at a former bulk chemical storage facility where chlorinated volatile organic compounds (VOCs) and heavy metals were identified. The project tasks include soil and groundwater investigation of approximately 50 acres, **geophysical investigation** in residential neighborhood, **vapor intrusion investigation** onsite and offsite (residential neighborhood, commercial and industrial properties, and a high

school), ambient air investigation, air sparge/soil vapor extraction (AS/SVE) **pilot study**, and insitu chemical oxidation (ISCO) bench and **pilot studies**. WSP conducted a pilot study, testing three approaches to control vapor emissions to ambient air during soil excavation including the use of a liquid surfactant, foam suppressant, and a temporary structure with VOC filtering air handling units. The Pilot Study included the use of **Enviroblend™** to mitigate the high concentrations of heavy metals including lead and chromium during pilot study. The project tasks also included the development of **design specifications** and drawings for soil removal and disposal, installation of an AS/SVE remediation system, and ISCO. WSP is currently designing specifications for a full-scale soil excavation remedy. An **RMS, geotechnical investigation**, and **waste characterization sampling** were completed, and multiple monitoring **wells were abandoned** in preparation for the full-scale soil excavation work. WSP will provide **construction oversight** on behalf of EGLE during the full-scale soil excavation.

# Staff Engineer; EGLE Part 201, Gudith Road Landfill, Woodhaven, MI (2017 - ongoing).

Responsible for updating bid specifications. A condominium complex consisting of 10 buildings was developed as a **brownfield project** over this unlicensed former landfill. There have been occurrences of **free product** in some of the building basement sumps and odors described as oil or solvent, and sub-slab vapor extraction systems were installed. WSP was hired to conduct an **investigation** of the source(s) of the free product and related odors, evaluate the effectiveness of the vapor extraction systems, **install and sample sub slab vapor pins** and inspect and seal cracks and joints in the basements. WSP also inspected the adjacent stormwater sewer system using **sewer cameras** to evaluate the potential that contaminated groundwater is entering the sewer system and being discharged to a detention basin. Following the inspection, the **sewer was cleaned by jetting**. WSP then developed **design specifications** for **dredging the detention basin** to remove sediment containing oily material, thereby preventing further discharges of oil to an adjacent creek. WSP assisted EGLE in procuring a trade contractor to conduct the dredging and WSP provided **construction oversight** of the contractor on behalf of EGLE.

Asbestos Inspector and Remedial Construction Oversight; EGLE Part 201, Forbes Dry Cleaners, Ypsilanti Township, MI (2018 - ongoing). Responsibilities included completion of asbestos survey, writing bid specifications for initial building demolition, and oversight of building demolition. WSP reviewed project deliverables and developed of project approaches in support of brownfield redevelopment. WSP completed an RMS as part of the pre-design investigation. The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCB-containing equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP developed design specifications for site remediation that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP implemented a program for delineating utility corridors (including the use of sewer cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater prior to building demolition. Coordinated a site-wide soil gas survey to aid in the

identification of VOCs. Facilitated indoor air and soil vapor point sampling on and around the site to evaluate the potential vapor intrusion risks throughout the site and adjacent properties. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. **Vapor mitigation systems were installed** in nearby residences based on soil vapor analytical results. WSP developed separate **design bid specifications** for both onsite and offsite **soil excavation** and developed a "Contained Out" letter to limit both onsite and offsite RCRA hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and **conducted oversight** of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph was used during the offsite excavation activities.

Staff Engineer; ECLE Part 201, 17627 Conant Street, Detroit, MI (2019 – ongoing). Responsible for asbestos sampling and collection of waste characterization sampling and wrote design bid specifications for building demolition. WSP implemented and conducted/managed the building demolition and a site-wide subsurface soil and groundwater investigation in support of brownfield redevelopment. Scope of work included historical records review, asbestos inspection, lead-based paint sampling and an RMS and preparation of a characteristically hazardous building materials evaluation. WSP developed design bid specifications for building demolition. WSP assisted EGLE with procurement of a demolition contractor and conducted oversight during the demolition. WSP is currently completing the construction documentation report.

Staff Engineer; ECLE Part 201, 6598 Helen Street, Detroit, MI (2020-ongoing). Responsible for sewer gas sampling and data tabulation. This **brownfield redevelopment** project began as a **remedial investigation (RI)** of soil and groundwater at this former gas station. WSP conducted an **RMS**. The survey included **asbestos**, **lead-based paint**, and stained concrete sampling. Based on the results of the RI and **RMS**, WSP developed **design bid specifications** to demolish the building, **remove the USTS**, and **excavate impacted soil**. WSP assisted with Trade Contractor procurement and provided **oversight** of the construction activities consisting of UST removal, soil excavation and building demolition.

Asbestos Inspector and Remedial Construction Oversight, EGLE Part 201 and Superfund, Former Electro-Plating Services (EPS), Madison Heights, MI (2021 - ongoing). Responsibilities included completion of asbestos survey, writing bid specifications for initial building demolition, and construction oversight of building demolition. A green liquid was found discharging from the I-696 embankment and draining into nearby storm water catch basins. EGLE and USEPA emergency response traced the source of impacts to illicit dumping of plating waste into a hole created in the basement of the EPS building. USEPA response included installation of PRBs and replacement of corroded sanitary and storm water infrastructure. WSP developed a Site CSM and conducted a subsequent data gap investigation to support remedial design, PRB performance monitoring plan and VIAP assessment work plan to address residual hexavalent chromium, PFAS, trichloroethylene (TCE) and cyanide impacts in soil and groundwater. The soil vapor investigation included the installation sub-slab and shallow soil vapor monitoring points that were sampled quarterly. WSP conducted a focused feasibility study to address the residual source and provided stakeholder outreach support and PRB operation, monitoring, and maintenance in support of EGLE. WSP developed design bid specifications for the demolition of the Site building, which was funded through a Brownfield Redevelopment Grant. WSP completed an RMS as part of

the pre-design investigation. The **RMS** included **asbestos, lead-based paint sampling**, and stained concrete sampling. In addition, the **RMS** identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, PCBcontaining equipment and materials, and miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes. WSP assisted EGLE with procurement of a demolition contractor and conducted **construction oversight** during the demolition. After the building was demolished, WSP conducted a waste **characterization investigation** of the soil and groundwater. WSP is currently completing a **bench study** to determine amendment mix ratios needed to reduce total and TCLP concentrations of contaminants in soil to below LDRs and RCRA characteristically hazardous criteria. WSP is developing bid specifications for the in-situ remediation of soil and groundwater which may also include excavation.

Task Manager, GSA, USCG Nationwide Housing Sites, Asbestos and Lead-Based Paint Surveys and Due Diligence (2021 - 2022). Task Manager for divestiture support for 11 housing units and other parcels in OH, ME, NC, NH, and NJ. The objective of the project was to obtain the necessary environmental and historic information on each property for (1) the USCG to meet its internal requirements for property disposal; (2) the USCG to comply with specific environmental and historic statutory requirements for each property sale; and (3) for GSA to develop any necessary environmental disclosure language for the housing sale. The scope involved preparing a consolidated Environmental Compliance Due Diligence Report for each location containing an Executive Summary outlining the overall findings and recommendations for each site based on the results of the due diligence efforts. This work included a Phase I environmental due diligence audit, a lead-based paint inspection and condition risk assessment, a lead in soil sampling and analysis, an asbestos containing material survey and condition/risk assessment, and NEPA data gathering. The Phase I Environmental Due Diligence Audits met CFATF Guide and CERCLA Documentation requirements and included identifying Recognized Conditions in accordance with ASTM1527-13 Standard, Lead-Based Paint Inspection and Condition/Risk Assessment; Lead in Soil Sampling and Analysis; an Asbestos Containing Material Survey and Conditions/Risk Assessment; NEPA Data Gathering and Reporting.

# Jason Grahn, Senior Engineer

Roles/Responsibilities: Construction Oversight and O&M		
Years of Experience: 25	<b>Education</b> : BS Environmental Engineering, Lake Superior State University, 1997	
Direct Employee, Traverse City, MI	<b>Registrations/Certifications:</b> OSHA 40-hour HAZWOPER Hazardous Materials, OSHA 8-hour Site Supervisor, Industrial Wastewater Plan Operator, SESC Storm Water Construction Management, 30 Hour OSHA Construction Management	

## RED BOLD DENOTES KEY PROJECTS, PROJECT TYPES AND SERVICES OFFERED

### Relevant Experience

*Project Engineer; EGLE Part 201 Wickes Manufacturing 5-Mile-Long TCE plume, Mancelona, MI (2007 - ongoing).* Responsible for **oversight** of field **investigation** and results using sonic drilling to depths of up to 586 feet at a total value over \$3.2 million. The project scope also included conducting investigation, vertical aquifer sampling, geophysical surveys (seismic profiling, induced polarity and electrical resistivity, and down hole gamma logging) multiple drilling methods for deep monitoring well installations], community relations for TCE plume extending 5 miles from source area, affecting more than 1,200 properties. To date, 17 monitoring wells have been abandoned.

Project Engineer; ECLE Part 201, Former Alpena Hide and Leather, Alpena, MI (2015 ongoing). Responsible for oversight of a phased remedial investigation that included electromagnetics (EM-31), ground penetrating radar (GPR) and down hole gamma logging, direct push, test pitting, pore water, storm water and surface water sample collection. RI activities included delineation of metals-related impacts in soil and groundwater using sonic drilling methods and assessment of migration into and along historic tannery and municipal storm water utility infrastructure. Pilot test studies performed at the Site included: direct push injection and soil mixing of biochar into the formation to reduce PFAS concentrations/migration in groundwater and to reduce infiltration into the submerged, impacted storm water infrastructure; emplacement of biochar mitigation materials into historical storm water infrastructure to mitigate direct migration of PFAS to the Thunder Bay River and recent studies to assess microbially enhanced transformation and/or destruction of PFAS using endemic microbes. WSP provided oversight of well abandonment and completed a remedial design, followed by construction oversight of a focused paved "cap" to reduce leaching to groundwater from vadose soil and installation of a sealed storm water conveyance system with biochar backfill amendments to further reduce PFAS migration.

*Project Engineer; H&H Tube and Manufacturing, Vapor Intrusion Pathway Assessment and Mitigation, Vanderbilt, MI (1987-ongoing).* Responsible for oversight of investigation and construction. Develop the system **O&M** plan and implemented. **Soil gas** and indoor air was tested at a 75,000-square foot active manufacturing facility where releases of trichloroethene had occurred in the past. A vapor intrusion assessment was performed to address to potential impacts to the building interior. Vapor points were installed throughout the facility and paired sub-slab vapor and indoor air samples were collected using EGLE guidance protocol during

the heating and cooling months. Results indicated indoor air impacts below screening levels. To support **design of a SSDS system** a **pilot test** was performed along with a Pressure Field Testing (PFT). Testing indicated the need for three SSDS systems to mitigate the footprint of the Site building. Performed **Construction oversight** of system installation and **O&M** services. Performance monitoring indicates depressurization coverage has been achieved.

*Project Engineer; EGLE Part 201/CERCLA Tar Lake Superfund Site; Mancelona, MI (1998-ongoing).* Responsible for **construction oversight** and system **O&M.** Project included overseeing the construction of a 20 well bio-sparge system and site monitoring well network. Also coordinated with the community and the EGLE to implement residential well sampling program prior to municipal water system installation.

*Project Engineer; WESCO Inc., Various, UST Excavation/Removal/locations throughout MI (1998-ongoing).* Responsible for **construction oversight** at multiple sites for a regional retail gasoline fueling station corporation. Tasks include **underground tank removal, soil excavation, water management and restoration**.

*Project Engineer; Confidential Client, Mishawaka, IN (2011-2013).* Responsible for permit application and demolition planning of an 82,000 square foot facility formerly used in the testing and manufacture of guided missiles. Work consisted of pre-demolition **Regulated Materials Surveys** that included an **asbestos survey, lead-based paint sampling**, testing of potential hazardous materials and **radiological screening**. WSP developed **design demolition specifications** and procurement plans. Under **construction oversight** by WSP, the building structures were razed to the ground surface and materials recycled or disposed.

**Project Engineer; Camp Grayling Air Guard, Grayling, MI (2017-ongoing).** Responsible for the implementation of the delineation plan for a **PFAS** plume around and downgradient of Air Guard Base known to be a source of PFAS contamination. **Oversight** of on-site sampling included the advancement of 60 vertical profile borings along with sample collection. Following identification of contamination off-site potable well sampling was performed collecting samples from 200 plus homes serviced by potable wells. Continued sampling plan with collection of samples from municipal supply wells and surface waters. PFAS were identified in Site soil and groundwater. WSP characterized PFAS in soil, groundwater, and surface water, and implemented PFAS immobilization pilot scale studies at the Site. **Pilot test** studies performed at the Site included: direct push injection and soil mixing of Plume Stop into the formation to reduce PFAS concentrations/migration in groundwater and to reduce impact to aquifer. Provided **oversight** of well abandonment.

Project Engineer; ECLE Former Werth Dry Cleaners, Remedial Investigation/Feasibility Study, Alpena, MI (2017-ongoing). Responsible for oversight of field testing and construction. Former dry cleaner and active auto dealership storage and car prep building. Conducted multi-phase site remedial investigation. Investigation of soil, groundwater and soil vapor for volatile organic compounds resulting from former dry-cleaning operations. Vapor points were installed throughout the facility and paired sub-slab vapor and indoor air samples were collected using EGLE guidance protocol during the heating and cooling months. Results indicated indoor air impacts below then published screening levels. To support design of a SSDS system a pilot test was performed along with a PFT. Testing indicated the need for two individual SSDS systems to mitigate the footprint of the Site building. Performed construction oversight of system installation and O&M services.

# 4. Management Summary, Work Plan, and Schedule

Per the DTMB Request for Proposal (RFP) Section II-4 is "not applicable to this ISID RFP response".

# 5. Questionnaire



# Department of Technology, Management and Budget 2023 Indefinite-Scope Indefinite-Delivery – Request for Qualifications Professional Environmental Consulting Services Questionnaire Various Locations, Michigan

**INSTRUCTIONS:** Firms shall complete the following information in the form provided. A separate sheet may be used if additional space is needed; please key the continuation paragraphs to the questionnaire. Answer questions completely and concisely to streamline the review process. If you provide information in this questionnaire that is relevant to any other parts of the proposal, please reference the article numbers to avoid repetition.

# **ARTICLE 1: BUSINESS ORGANIZATION**

 Full Name: WSP Engineering and Consulting of Michigan, Inc. Address: 46850 Magellan Drive, Suite 190, Novi, MI 48377 Telephone and Fax: 248-514-1260; 248-926-4009 Website: WSP.com E-Mail: garret.bondy@wsp.com SIGMA Vendor ID: CV005901

If applicable, state the branch office(s), partnering organization or other subordinate element(s) that will perform, or assist in performing, the work:

• Traverse City - 41 Hughes Dr, Traverse City, Mi 49684

If awarded a contract and / or subsequent assignment(s), state the specific SIGMA business address which you would like associated for all communication (Contracts, Contract Order, Contract Modifications and Payments)?

WSP Engineering and Consulting of Michigan, Inc. 46850 Magellan Drive, Suite 190 Novi, MI 48377 Attn: Garret Bondy

Please list all person(s) authorized to receive and sign a resulting contract and / or subsequent assignment(s). Please include persons name, title, address, email and phone number. Garret Bondy, Program Manager, 46850 Magellan Drive, Suite 190, Novi, MI; 248-514-1260; email garret.bondy@wsp.com

2. Check the appropriate status:

Individual firm Association Partnership Corporation, or Combination –

#### Explain: Click or tap here to enter text.

If you operate as a corporation, include the state in which you are incorporated and the date of incorporation:

#### Deleware, January 6, 1992

Include a brief history of the Professional's firm:

WSP's commitment to outstanding customer satisfaction has fueled our growth for more than a century. Our roots extend back to the E.C. Jordan Company, which was founded in Portland, ME in 1873, making us one of the longest sustaining engineering companies in the United States. E.C. Jordan established its Michigan operation in 1983 and was awarded the first State of Michigan Level of Effort (LOE) contract that same year. E.C. Jordan was purchased by Combustion Engineering Environmental, Inc. in 1987, which was acquired by ABB Environmental Services, Inc. (ABB-ES) in 1990. Harding Lawson Associates (HLA) of Denver, CO bought ABB-ES in 1998, and was purchased by MACTEC, Inc. located in Golden, CO, in 2000. AMEC Environment and Infrastructure, Inc. (AMEC) acquired MACTEC in June of 2011. In 2014, AMEC acquired Foster Wheeler and on January 1, 2015, the AMEC Environment & Infrastructure, Inc. name was changed to Amec Foster Wheeler Environment & Infrastructure, Inc. In April 2018, Amec Foster Wheeler was purchased by the Wood Group and the entire entity was re-named Wood PLC. In September 2022, WSP Global, Inc. (WSP) purchased the Wood subsidiary, Wood Environment Infrastructure, Inc.

WSP Engineering and Consulting of Michigan, Inc.is a wholly owned subsidiary of WSP, Inc. and meets State requirements to conduct business as an engineering firm in Michigan.

3. Provide an organization chart depicting key personnel and their roles for a typical assigned project. Include generic supporting staff positions.

Exhibit 3-2 in Section 3.2 provides an organizational chart of our Proposed Team for this contract. Below is an organizational chart of a typical project. In developing this organizational chart, it was assumed that this typical project is one involving PFAS in soil and groundwater and an investigation is to be conducted, followed by a feasibility study, design and construction of the selected remedy and operation and maintenance of the installed remedy.



4. Has there been a recent change in organizational structure (e.g., management team) or control (e.g. merger or acquisition) of your company? If the answer is yes: (a) explain why the change occurred and (b) how this change affected your company.

Yes

- (a) Our previous parent company, Wood PLC, sold it's subsidiary, Wood Environment and Infrastructure Solutions, Inc. to WSP Global, Inc.
- (b) Our Michigan licenced entity has changed its name from AMEC Engineering and Consulting of Michigan, Inc. to WSP Engineering and Consulting of Michigan, Inc. Combining WSP resources with existing Wood Environment and Infrastructure, Inc. resources increases our capacity and skill sets available to the State of Michigan.
- 5. Provide a four year rate schedule per position.

Please see II-2-A. Position, Classification and Employee Billing Rate Table (Attachement A)

# ARTICLE 2: PROJECT TYPES AND SERVICES OFFERED

Identify the project types and professional services for which your firm is exceptionally qualified and experienced. Contractor should have the capability to form potential teams with adequate experience in environmental investigation and remediation services. Provide attachments illustrating a minimum of three examples, with references, of successful projects performed in the last five years for each item checked. Identification of specialties will assist the State project directors/managers in matching firms with projects.

Asbestos / Lead / Mold / Biohazard / Free Product / Regulated Waste Survey /

Abatement

- Brownfield Development
- Ecological Risk Assessment / Forestry and Land Management / Wetland
   Mitigation / Streams and Lakes Restoration
- Environmental Investigation / Characterization / Pilot Tests / Feasibility Study
- Servironmental/ Roto Sonic Drilling / Well Abandonment
- Ground Penetrating Radar (GPR) / Laser-Induced Fluorescence (LIF) Field Screening
- ☑ Landfill Maintenance / Monitoring
- ☑ Nuclear Waste Management / Disposal / Remediation
- Per-& Polyfluoroalkyl Substances (PFAS) Sampling / Mitigation / Remediation
- Phase I / Phase II / Baseline Environmental Assessments
- Remediation Systems Design / Construction Oversight / O&M / Decommissioning
- Specialty Sub-Surface / Utility Inspection / Sewer Camera / Cleaning
- ☑ Underground / Aboveground Storage Tank (UST/AST) Removal / Demolition /
- Soil Excavation / Closure
- ☑ Vapor Intrusion Assessments / Risk Mitigation / Design / Installation / O&M Services

# ARTICLE 3: PROJECT LOCATION

Identify the regions where your firm can most efficiently provide services. Assignments may vary from the regions checked, depending on the specialties and services required.

- ⊠ Western Upper Peninsula (west of Marquette)
- Eastern Upper Peninsula (east of Marquette)
- ⊠ Northern Lower Peninsula (north of Grayling)
- Saginaw Bay area (east of 127, north of I-69 and M 57, south of Grayling)

- Western Lower Peninsula (west of 127, north of Muskegon, south of Grayling)
- Central Lower Peninsula (east of Battle Creek, west of Chelsea, south of M 46 and M 57)
- Southwestern Lower Peninsula (west of Battle Creek, south of Muskegon)
- Southeastern Lower Peninsula (east of Chelsea, south of I-69)

# **ARTICLE 4: CONTRACT UNDERSTANDING**

The following items should be addressed on the assumption that your firm is awarded an Indefinite-Scope, Indefinite-Delivery contract. (See attached sample contract).

4.1 Is it understood that your firm is required to respond to small projects (less than \$25,000) as well as larger projects?

Yes ⊠ No □

4.2 Is it understood that there is no guarantee of any work under this contract?

Yes 🛛 No 🗆

4.3 Is it understood that your firm will be required to execute the attached standard State of Michigan contract language for professional services?

Yes ⊠ No □

4.4 Is it clearly understood that professional liability insurance is required at the time of execution of the ISID contract? (See Article 5 of the attached Sample Contract.)

Yes ⊠ No □

4.5 Is it understood that your firm must comply with State of Michigan law as it applies to your services?

Yes ⊠ No □

4.6 Does your firm have prior experience working with the State of Michigan?

Yes  $\boxtimes$  No  $\square$ 

If yes, explain:

E.C. Jordan established its Michigan operation in 1983 and was awarded the first State of Michigan Level of Effort (LOE) contract that same year. Since that time our firm has continuously held multiple contracts providing similar services for the State of Michigan.

# ARTICLE 5: CAPACITY AND QUALITY

5.1 Briefly describe your firm's methods and procedures for quality control for your deliverables and services.

WSP's QA/QC Program focuses on preventing errors, not reacting to them later. Our QA/QC program starts from the top down and every employee is trained from day one in the proper QA/QC procedures. The QA/QC program is executed throughout the life of the project and covers all aspects of the project work. WSP's QA Program consists of the following related components.

Our QA Program follows the criteria for QA outlined in the Code of Federal Regulations, 10 CFR 50, Appendix B, and in ASME NQA-1. Pertinent elements of other QA Program guidance documents such as ANSI/ASQC 9001 (ISO 9001), ANSI/ASQC E-4, and 10 CFR 830.120/DOE 5700.6C are incorporated as appropriate. The system of functions and controls established apply to all disciplines and scope of services provided by WSP to the State and includes:

- Written Procedures and Guidance–An established and tested system for communicating procedures necessary to ensure the quality and consistency of consulting services and work products.
- Assignment of Responsibilities—Appointment of qualified professionals to manage the Program and oversee personnel performing task order activities.
- Training–Regarding the principles of the Program, as well as specific project procedures to ensure client satisfaction.
- QC Review—A process that includes reviews of reports and designs, as well as peer, constructability, and value engineering reviews, including environmental safeguards, natural resource protection, and enhancement.
- Client Service Surveys and Interviews—To ensure a partnering environment and client satisfaction.
- Work Process Analysis–A process improvement technique for simplifying work processes while maintaining high quality standards.

WSP has used this time-tested QA Program on previous State projects. In accordance with WSP's Quality Assurance Program, all deliverables will be reviewed and approved for delivery to the State by the WSP's Project Manager and a Principal qualified in the subject matter. Quality will be controlled using a three-tiered approach, as described below.

- *Tier I* is the responsibility of the Team member who has the lead on the respective task. Calculations, designs, details, specifications, costs, and all other work products will be reviewed by a Principal of the Team member's staff.
- *Tier 2* commences once the product is complete, and the originator of the work product and the Principal have signed off on the product, indicating that it is ready for additional review. It will then be provided to one of the other Team members. Comments will be provided to the originating Team member and changes made as appropriate. These activities will be documented.
- *Tier 3* involves auditing by our corporate QA/QC Manager to ensure that these procedures are being followed and documented. Audit results are presented to the Project Manager and Principal-QA/Officer, who are then required to prepare appropriate response plans to address deficiencies noted during the audits.

The benefits WSP's QA Program brings to the State include:

- An established, functional and proven QA/QC system that delivers high caliber services and documents every time
- A Quality Assurance Manual that specifically details practices to be followed on all projects, so resulting in a consistent product from WSP
- A highly experienced Project Team that has worked together for years on State projects and practice proper QA/QC techniques as a normal course of business.
- 5.2 Has your firm been involved in claims or suits associated with professional services errors and / or omissions?

Yes ⊠ No □

If yes, explain:

If yes, explain: WSP is a large international service company and as such, there are inevitably minor disputes arising from time to time. While details of these disputes are confidential, we can confirm that there are no disputes or litigation of any kind that individually or collectively will have a material effect upon the quality of WSP's performance and its ability to provide services for this contract. The Company has never failed to complete a project for which it was paid by the client. From time to time, the Company's clients have suspended or terminated projects for their convenience.

5.3 Will there be a key person who is assigned to a project for its duration?

Yes ⊠ No □

5.4 Please present your understanding of the relationship between your firm, the DTMB Design and Construction Division, and the State Agency for whom a project will be completed.

WSP will be under contract to the DTMB Design and Construction Division, who will be responsible for administering the contract. It is WSP's responsibility to comply with the terms of the contract. Various State Agencies, (e.g. DTMB, EGLE, MDNR, MDMVA, etc.) can use this contract to access WSP for desired services as allowed by the contract. WSP will work with the Agency requesting services to define the desired scope, schedule and budget. Once these are agreed upon, WSP will submit the appropriate assignment form (for a new project) or a contract modification (for an ongoing project) to the requesting agency for review, and if acceptable, approval and issuance of either a project assignment for a new project or a change order to ongoing projects. DTMB then issues the assignment or modification to WSP. During the course of the project, WSP will provide monthly progress reports and payment requests to the State Agency Project Manager for review, and if acceptable, processing for invoice payment. Upon successful completion of the project, WSP will assure subcontractors have received payment prior to initiation of a modification to close out the project.

5.5 Describe your approach if a bidder proposes a substitution of a specified material during bidding.

If, during the bidding process, a contractor proposes a different material than specified, WSP would evaluate and determine if it's equal or better than the specified material. WSP would contact the State PM with our recommendation. WSP would

then, as part of an addendum, communicate to all the bidders if the material is acceptable.

5.6 Describe your approach if a contractor proposes a substitution of a specified material or detail with shop drawing submittals or in construction.

WSP would review the proposed material change to determine if it is equal or better than the material specified and determine if the State would receive a credit. WSP would then contact the State PM with our recommendation. WSP would then, as part of our submittal review process, provided a written response, followed by a bulletin for the change to the contractor, if warranted.

5.7 How will your firm provide consistent and continuous communication pertaining to project activities and project status to the State of Michigan during the progress of projects?

WSP conducts regular project status meetings with the State. These are either face-toface meetings, e-mail, or by teleconference. The frequency of communication depends on the level of project activity. WSP will develop and distribute an agenda prior to the meeting and issue meeting minutes after the meeting. During the meeting, WSP will discuss the project status, including work completed, future work, project schedule, project quantities, invoicing, regulatory and safety compliance, new and outstanding construction issues and potential changes. Potential changes in agreed upon scope of work are discussed with the State before implementing. WSP also prepares monthly progress reports. These reports will summarize the progress made during the previous period, the progress expected to be made during the upcoming period, problems and/or variations in the scope, schedule, or budget, and the associated resolutions, and any daily field activity logs will be attached.

- 5.8 Does your company have an FTP or similar site for quick posting and distribution of information, drawings, field inspection reports, and other communications?
   Yes ⊠ No □
- 5.9 Describe your method of estimating construction costs and demonstrate the validity of that method.

Cost estimates are developed utilizing actual past construction costs, contractor and vendor supplied budgetary quotes and a mixture of top down and bottom up estimating techniques based on project experience. Vendor quotes provide the basis for major cost items. Work items not covered by quotes, are estimated primarily by bottom up estimating. Published cost data is also utilized to cost items as well as provide a check on the bottom up estimated items. Cost estimates are often developed using Hard Dollar™ software and reviewed by a senior estimator following WSP standard operating and QA/QC procedures. Estimates are reviewed for accuracy upon receipt of bids. In cases where our estimate differs significantly from a contractor quote, we request backup for the quote and evaluate the quote's validity.

5.10 Describe your approach to minimizing construction cost over-runs.

Cost over-runs are typically the result of inadequate planning and poor communication. In the planning and design phase, appropriate resources are applied to the project and strict QA/QC procedures are followed to achieve a complete and accurate design. Constructability and risk reviews are completed during design to identify potential implementation issues which can lead to cost escalation. Prior to selecting a contractor or during the pre-construction phase, a constructability review meeting is conducted with the contractor to review the scope of work and the proposed means and methods to accomplish the work. This process identifies potential issues before construction starts, allowing the Team to address issues before they are realized in the field, ultimately minimizing change orders during construction. During construction, weekly progress meetings are conducted with the entire construction Project Team. All issues are discussed and resolved in a timely fashion through the implementation of action item lists that define a responsible party and required completion date.

5.11 What percentage of the construction cost should be devoted to construction administration (office and field)?

5-15%, depending on the cost and complexity of the construction project.

5.12 What portion of the assigned work will be performed with your staff and what portion will be provided by sub-consultants?

WSP staff will complete 95% to 100% of the assigned work. If the occasion arises where a sub-consutant can provide a speciality service better then WSP or a specific subsonsultant is requested by the State then WSP will use one.

5.13 On a typical project, what would be your response time, from the time receive a project assignment to starting investigation and design work? A typical project might be one involving several disciplines and in the neighborhood of a \$25,000 fee.)

#### WSP can start a project within one week.

5.14 How do you assess whether a construction bidder is responsive and responsible?

WSP would review the bid to verify if the bidder is qualified to conduct the work. This would include confirming the bidder has provided all of the required documentation, and meets the minimum experience requirements as specified in the bidding documents. WSP would also check references and compare bid item costs to our cost estimate and costs from all the bidders to determine if the bid items are balanced and legitimate. If there are any concerns with the bid, WSP would conduct a Pre-Award meeting with the bidder DTMB and the State PM. During the Pre-Award meeting WSP would complete DTMB's "Best Value Construction Bidder Evaluation" form and give an opportunity for all parties to discuss the work and any bid irregularities. After consultation with DTMB and the State PM, WSP would provide the State, in writing, with our recommendation

5.15 Describe your experience with similar ISID contracts.

WSP has been conducting projects under this type of contract since winning our first ISID (Discretionary) contract in 2008. We currently have 4 such active contracts (EER-00464, ISID-00517, EER-00698 and ISID-00749). Given this experience, we have a thorough understanding of contracting with DTMB.

5.16 Describe your approach to a construction contractor's request for additional compensation for a change in the project scope.

WSP bid specifications are prepared and reviewed to minimize change orders. Upon receipt of a written request for a change in scope, the project manual is reviewed to make sure the change is not a part of the base contract. If the State, with WSP support, believe that additional compensation may be warranted, either for time, materials, equipment and/or labor, WSP will prepare a bulletin requesting a detailed breakdown of the contractor's additional costs. This breakdown will be reviewed by WSP and the State. If agreed to by the State, engineer and contractor, a formal change order is issued.

5.17 Is a sample of field activity logs detailing a 1-week period (from one of the three (3) prior experience sites) and a weekly report provided?

⊠Yes □No Provided in Attachment D

# **ARTICLE 6: PERSONNEL STAFFING**

6.1 Is an organizational chart that includes each person on your project team and their identified roles for a typical assigned project provided?

⊠Yes □No

See Section 3.2, Exhibit 3-2.

6.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of the study or project scope of work:

Key Personnel 1 Name: **Garret Bondy**, PE Job Title: **Program Manager** Labor Classification: **P4** College Degree(s): **BS, Environmental Science Engineering, 1979** 

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training?

 Key Personnel 2

 Name:
 Jason Armstrong, CPG

 Job Title:
 Project Manager

 Labor Classification:
 P3

 College Degree(s):
 BS, Environmental Geosciences, 1999

 Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training?
 ☐Yes ⊠No

Key Personnel 3 Name: Saamih Bashir, PE Job Title: Project Manager Labor Classification: P4 College Degree(s): Msc. Civil Engineering, 2003 Bsc. Civil Engineering, 2000

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? Xes No

Key Personnel 4 Name: Megan Cynar Job Title: Project Manager Labor Classification: P3 College Degree(s): BS, Environmental Studies

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

#### Key Personnel 5

Name: Michael McCowan, PE Job Title: PM/Eng./Construction Oversight/O&M Labor Classification: P4 College Degree(s): BS, Envir Engineering, 1992; Assoc. Degree, General Engineering, 1989 Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? Yes No

Key Personnel 6

Name: Seven Murray, CPG Job Title: Project Manager/Environmental Investigation Labor Classification: P4 College Degree(s): BS, Geology, 1985

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? ⊠Yes □No

Key Personnel 7

Name: Nick Rogers Job Title: Project Manager/Environmental Investigation/O&M Labor Classification: P3 College Degree(s): BS, Science in Geology, 1998

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training?

<u>Key Personnel 8</u> Name: **Doug Saigh, CPG** Job Title: **Project Manager/Construction Oversight** Labor Classification: **P3** College Degree(s): **BS, Geology, 1998** 

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? Xes No

Key Personnel 9 Name: Sean Cormley Job Title: PFAS National Leads/Environmental Investigation Labor Classification: P4 College Degree(s): BS, Chemistry, 1987

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? ☐Yes ⊠No

Key Personnel 10 Name: Shalene Thomas, PMP Job Title: PFAS National Leads Labor Classification: P4 College Degree(s): MS, Environmental Science & Mgmt. 1998; BS, Biology, 1996 Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER)

training with an up to date 8 hour HAZWOPER refresher training?  $\Box$  Yes  $\boxtimes$  No

 Key Personnel 11

 Name: Dave Woodward

 Job Title: PFAS National Leads

 Labor Classification: P4

 College Degree(s): BS, Earth Science/Cartography/ Mined Land Reclamation 1984

 Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? ⊠Yes □No

 Key Personnel 12

 Name: Anita Emery-DeVisser, CMNSP

 Job Title: Environmental Investigation

Labor Classification: P3 College Degree(s): MS, Resource Development, Natural Resource Management, 1993; BS, Geography, 1984

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

Key Personnel 13

Name: Len Mankowski Job Title: Environmental Investigation Labor Classification: P3 College Degree(s): MS, Geology, 2003; BS, Applied Geophysics, 1999

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

Key Personnel 14 Name: Justin Gal, PE Job Title: Engineering/Construction Oversight/O&M Labor Classification: P3 College Degree(s): BS, Civil and Environmental Engineering, 2004

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? ⊠Yes □No

Key Personnel 15 Name: Jeshua Hansen, PE Job Title: Engineering Labor Classification: P3 College Degree(s): MS, Environmental Engineering, Present; BS Science/Agricultural Engineering, 2000

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? ⊠Yes □No

Key Personnel 16 Name: Deanna Hutsell, PE Job Title: Engineering Labor Classification: P3 College Degree(s): BS, Environmental Engineering, 2002

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

Key Personnel 17

Name: Jeff Lively, RRPT Job Title: Engineering Labor Classification: P4 College Degree(s): Naval Nuclear Power Program, 12/1977-12/1988

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? Xes No

Key Personnel 18 Name: Nate Peck, PE Job Title: Engineering Labor Classification: P3 College Degree(s): BS, Environmental Engineering, 2012

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

Key Personnel 19 Name: Lindsay Selvig Job Title: Engineering Labor Classification: P2 College Degree(s): BS, Environmental Engineer

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training? Xes No

Key Personnel 20 Name: Jason Grahn Job Title: Construction Oversight/O&M Labor Classification P3 College Degree(s): BS, Environmental Engineering, 1997

Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?
6.3 Does the Professional Project Manager (PM) have at least three years' experience as a PM?  $\square$  Yes  $\square$ No

Program/Project Managers	Years Experience as PM
Garret Bondy, PE	31
Saamih Bashir, PE, PMP	11
Megan Cynar, PE	7
Michael McGowan, PE	21
Steve Murray, CPG	20
Nick Rogers	7
Doug Saigh	17

6.4 Does the Professional PM have a minimum of 10 years' experience with similar projects?  $\boxtimes$  Yes  $\Box$ No

Program/Project Managers	Years Experience at Similar Sites
Garret Bondy, PE	33
Saamih Bashir, PE, PMP	21
Megan Cynar, PE	17
Michael McGowan, PE	25
Steve Murray, CPG	33
Nick Rogers	21
Doug Saigh	23

6.5 Are the resumes for the key personnel provided?  $\boxtimes$  Yes  $\Box$ No

#### Provided in Section 3

#### **ARTICLE 7: SPECIAL FACTORS**

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. that would pertain to this RFP. (As examples: any awards or recognition received by the firm or individuals for similar work, special approaches or concepts developed by the firm appropriate to this project, financial capacity, etc. Respondents may say anything they wish in support of their qualifications). Click or tap here to enter text.

#### **Innovations to Support the State in Achieving Its Mission**

### Our Team gains great satisfaction in assisting clients in achieving program objectives, protecting human health and the environment.

At a landfill in Michigan, a 150 gallon per minute groundwater pump and treat system is capturing and treating groundwater to remove VOCs. Upon discovery of PFAS in the groundwater influent, our Michigan-based engineers were hired to design system modifications to remove PFAS. WSP designed and conducted an on-site column study to evaluate the effectiveness of activated carbon and an ion exchange resin in removing PFAS. Results of the study indicated that both materials were effective in removing PFAS but that the resin was more effective in removing short-chain PFAS compounds present on the groundwater and required less maintenance than carbon. *As result, WSP designed, installed, commissioned and is monitoring the resin-based system.* 

At the Spartan chemical Superfund Site, WSP completed a pilot study to evaluate various methods to control emissions during soil excavation and stabilization. Three methods for controlling VOC emissions were evaluated: foam Suppressant (Rusmar RusFoam® OC), liquid surfactant (Biosolve Pinkwater®), and a temporary structure fitted with VOC filtering air units. To evaluate each method four excavations were completed. At least one of the methods was used at each of the excavations. Liquid surfactant was used to suppress airborne VOC vapors at the perimeter of the excavations. Perimeter ambient air was monitored by WSP using a portable gas chromatograph to evaluate the effectiveness of each vapor mitigation method. Based on the results of the Pilot Study, *WSP recommended Pinkwater® for airborne suppression of the VOC vapors during the excavation and loading of impacted soil, and RusFoam® for overnight cover of the impacted soil so that EGLE could proceed safely with the excavation.* 

At Camp Grayling, WSP conducted a pilot test by injecting PlumeStop,<sup>®</sup> to create a permeable reactive barrier (PRB) to adsorb PFAS and PCE from groundwater. *In 2022 (i.e., 4-years into the test), downgradient concentrations of PFAS and PCE remain below drinking water and GSI criteria.* 

Working with the EGLE Remediation and Redevelopment Division and the Materials Management Division, WSP recently completed the <u>first-ever</u> "contained-out" EGLE determination for soil thought to contain a RCRA-listed hazardous waste. EGLE determined that soils at that facility did not have concentrations above applicable heath based levels and therefore did not contain a listed hazardous waste - *this allowed soils to be disposed as non-hazardous material that saved the Site hundreds of thousands of dollars (to date) in waste disposal fees.* 

#### **Recognitions of Our Services**

#### Below is just a sampling of the recognitions our Team has recently received.

<u>Regarding WSP's Kalamazoo River Project, Kalamazoo, Michigan</u> *"I don't know if there's a better example, frankly, of the success of the Superfund cleanup in the country than right here in Michigan along the Kalamazoo (River)."* 

Cathy Stepp, USEPA Region 5 Administrator,

#### Regarding WSP's Lower Rouge River-Old Channel Project, Detroit, Michigan

Outstanding, Laura, it's not every day you save your client over a million dollars! WOOD has done an exceptional job of tracking all of the costs for the Rouge River GLNPO projects. In this case not only tracking costs but also excellent record keeping, from RI/FS to RD and to RA. Thank you!

> Chuck Geadelmann, P.E., Corporate Remediation Manager Confidential Client

#### <u>Regarding WSP's 6598 Helen/El Johnson Service Project, Detroit, Michigan</u>

Doug not only understands the project management work and does it well, but he also understands and shares my philosophy about the people and the neighborhood that we are doing the work for. That is invaluable to me as RRD continues its efforts in Wayne County. Thanks for all you do Doug!

Beth Vens, EGLE Remediation and Redevelopment Division

#### Regarding WSP's Wickes Mancelona Project, Mancelona, Michigan

Throughout the years Wood has managed all of my projects professionally and within budget. The organization, innovation, and technical knowledge Wood has utilized at all of my projects which include complex geology and new emerging contaminate sites has been exceptional. Wood is involved in six major remediation projects which I manage including a project with one of the longest TCE plumes in the nation and another with complex PFAS issues. Len Mankowski', Traverse City, Michigan office, is an outstanding geologist/geophysicist. His skills in communication, all aspects of science, and his innovated approach at difficult and complicated projects have lead to the protection of public health, safety, welfare, and the environment.

Janice Adams, EGLE Gaylord District Office

#### **Presentations/Publications from Our Proposed Team**

### *Our proposed Project Team is well published and stays on the cutting edge of environmental remediation, as demonstrated below:*

"In-Situ Carbon-Based Immobilization and Beyond; Case Study at a Suspected AFFF Site in Alpena, Mi – New Approaches to Assess and Address PFAS." Battelle 12<sup>th</sup> International Conference on Remediation of Chlorinated Compounds. May 22-26, 2022, Palm Springs, California.

'Successful Desktop and Field Bioremediation of Perfluoroalkyl Substances." Battelle 12<sup>th</sup> International Conference on Remediation of Chlorinated Compounds, May 22-26, 2022, Palm Springs, California.

<sup>(Developing an In-Situ Carbon-Based Immobilization and Bioaugmentation Approach to Address PFAS at a Suspected AFFF Site (Alpena, Mi)." 2021 International Conference on Remediation of Chlorinated Compounds, June 27-July 1, 2021, Portland, Oregon.</sup>

"Beyond Precursor Biotransformation - Desktop Studies of Bioremediation of Perfluoroalkyl Substances." 2021 International Conference on Remediation of Chlorinated Compounds, June 27-July 1, 2021, Portland, Oregon.

"Vapor Mitigation System Performance Assessment and Improvement." Wood Vapor Intrusion Webinar Series. June 2021.

"Alpena Hide and Leather - New Approaches to Assess and Address PFAS." Great Lakes Virtual PFAS Summit, October 2020, Michigan.

"The Promise and Pitfalls of In-Situ Carbon Immobilization of PFAS, Two Case Studies from Michigan." American Institute of Professional Geologists, AIPG 2020 PFAS: Beyond the Theoretical and What's Working, February 2020, Madison, Wisconsin.

"Project Closeout & Lessons Learned- Great Lakes National Program Office - LRROC Sheetpile Wall Installation." Clague Middle School Technology Fair. February 2020.

"Lessons Learned on Various In-Situ and Ex-Situ PFAS Treatment Technologies." Great Lakes Environmental Remediation & Redevelopment Conference. October 2019

"PFAS Behavior in the Environment and Routes of Exposure." Wisconsin American Institute of Professional Geologists. May 2019

"Incorporating Hydraulic Conductivity End Members into the Conceptual Site Model, A Case Study." Former Dry Cleaner Site in Ann Arber, Michigan Department of Environmental Quality (Internal) Geologist Outreach, Ralph A McMillan Center, Roscommon, MI, October 2018.

"Recent Developments in Alternatives for PFAS Groundwater Treatment Including an Emerging On-Site Destruction Technology." Michigan American Institute of Professional Geologists. June 2018

'Geophysical Mapping Efforts for Landfill Delineation in Support of Conceptual Model Development." Symposium on the Application of Geophysics to Engineering and Environmental Problems, March 2017, Denver, Colorado.

"Avoiding Construction Risks When Integrating Upland and Water-Side Remediation." Amec 2015 Symposium on contaminated sediment. March 2015

"Results from Historical Uncontrolled Release of Industrial Liquids." Wickes Manufacturing TCE Plume, Mancelona, Michigan. No-Spills Annual Conference, January 2014, Traverse City, Michigan. "A Well Field at Risk." Wood Technical Conference, September 2014, Las Vegas, Nevada.

"Lateral LNAPL Mobility Evaluation Using Well Baildown Test Method." 2013 Amec Technical Symposium. November 2013

"Well Baildown Test Procedures for Lateral LNAPL Mobility Testing." Michigan Association of Environmental Professionals, Professional Development Seminar. September 2013

#### **ARTICLE 8: EXPERIENCE**

8.1 Provide a client reference and brief descriptions of **at least three (3) projects in the last five years closely related to each of the project types** and professional services requested in this RFP. Emphasis shall be placed on recent work at sites of environmental contamination:

Exhibit 8-1 summarizes the services conducted on our example projects. Descriptions of these sample project follows Exhibit 8-1.

#### Exhibit 8-1. Services by Project Experience

Projects and Services	Start Date	End Date	Asbestos/ Lead /Mold / Biohazard / Free Product / Regulated Waste Survey/	Abatement	Brownfield	Ecological Risk Assessment / Forestry and Land Management /Wetland Mitigation / Streams and Lakes Restoration	Environmental Investigation / Characterization / Pilot Tests / Feasibility Study	Environmental/ Roto Sonic Drilling / Well Abandonment	Ground Penetrating Radar (GPR) / Laser-Induced Fluorescence (LIF) Field	Landfill Maintenance / Monitoring	Nuclear Waste Management / Disposal / Remediation	Per-& Polyfluoroalkyl Substances (PFAS) Sampling / Mitigation / Remediation	Phase I / Phase II / Baseline Environmental Assessments	Remediation Systems Design / Construction Oversight / O&M / Decommissioning	Specialty Sub-Surface / Utility Inspection / Sewer Camera / Cleaning	Underground / Aboveground Storage Tank (UST/AST) Removal / Demolition / Soil Excavation / Closure	Vapor Intrusion Assessments / Risk Mitigation / Design / Installation / O&M Services
17627 Conant Street	2019	Ongoing	•		•											•	
6598 Helen/El Johnson Service	2020	Ongoing	•		•											•	
Alpena Hide and Leather	2015	Ongoing			•	•	•	•	•			•		•	•		
Alameda LLRW Excavation and Disposal Cell	2008	2018					•			•	•			•			
Broadway Coin Laundry	2017	Ongoing			•	•	•	٠	•				•				٠
Cals Car Care	2008	Ongoing	•		•		•	•	•				•			•	•
Collet Dump	2009	Ongoing					•			•		•					٠
Confidential Landfill	2018	Ongoing					•			•		•		•			
Detroit Refinery	2002	Ongoing	•		•		•	•	•					•	•	•	٠
Electro-Plating Services	2021	Ongoing	•		•		•					•		•		•	
Forbes Dry Cleaners	2018	Ongoing	•		•		•		•					•	•	•	٠
Former Chemical Plant (Danville)	2017	Ongoing	•				•		•					•	•		٠
Former JB Sims Generating Station - Harbor Island	2022	Ongoing				•	•	•		•		•	•	•		•	
Fort Gratiot Landfill	2018	Ongoing				•	•			•		•		•		•	
Gudith Road	2017	Ongoing	•		•	•	•		•	•				•	•		•
Harbor Plating	2005	Ongoing				•	•					•		•			
Hensley Property	2017	Ongoing	•		•		•		•					•			•
Kalamazoo River	2013	Ongoing				•	•							•			
Lower Rouge River	2010	Ongoing	•			•	•		•					•			
Marshall Iron and Metal	2015	Ongoing	•				•		•					•	•		٠
Michner Plating	2018	Ongoing	•		•							•	٠	•			•
Nuclear Facility Demolition/Remediation	1997	2018	•		•	•	•				•			•	•	•	
Port Granby LLRW Disposal Facility Construction	2015	Ongoing					•			٠	•			٠			
Rose Lake Shooting Range	2009	2019	•			•	•										
Spartan Chemical Superfund	2010	Ongoing	•				•	•	•					٠		•	•
Telecraft Shopping Center	2017	Ongoing				•	•		•						•		•
USDOE Uranium Tailings Remediation	2016	2021					•			•	•			•			
Wickes Manufacturing TCE Plume	2007	Ongoing					•	•	•								•
Wurtsmith	2021	Ongoing								•		•	•	•	•		

# 6598 Helen/El Johnson Service

**Key Personnel:** Garret Bondy, Douglas Saigh, Michael McGowan, Lindsey Selvig **Project Address:** 6598 Helen Street, Detroit, Wayne County, Michigan **Contact Name and Telephone:** Beth Vens, EGLE Remediation and Redevelopment Division; (586) 753-3700

#### Relevance to Work Requested in RFP:

- · Wayne State CURES Pilot Program Support
- File Review and Data Evaluation
- Asbestos and Regulated Materials Survey
- · Geophysical Survey
- Asbestos and Regulated Materials Abatement
- Subsurface Investigation
- Bid Specifications
- Regulated Materials Abatement and Building Demolition
- UST and UHL Removal
- · Sewer Gas Sampling Program

**Description** – The Site historically was developed as a mixed-use commercial/residential development as a public gas station with automotive repair and second story residential flat. The building was built in 1935 as a single-story 897-square foot slab-on-grade retail building and a second story living space was built in the 1940s. The Site reportedly operated as a commercial gas station and automotive repair shop from 1935 until the 1990s when it became vacant and ultimately abandoned. The City of Detroit acquired ownership through tax reversion and completed a Phase I Environmental Site Assessment (ESA), a Phase II ESA, and an asbestos and regulated materials survey (ARMS). The environmental reports identified asbestos, historical use of two underground storage tanks (USTs), an underground hydraulic lift (UHL), and soil contamination.

WSP was contracted in August 2020 to complete a historical file review, a pre-demolition ARMS, waste characterization, subsurface investigation, prepare regulated materials abatement and demolition specifications, and continue with sewer gas sampling events to evaluate the soil, groundwater, soil gas, and sewer gas migration pathways.

**CURES Pilot Program Support** - WSP collaborated with the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) and Wayne State University in support of The Center for Urban Responses to Environmental Stressors (CURES) Pilot Project Program examining the vapor mobility of volatile organic compounds (VOCs) in



#### Project Highlights:

- Site was a former gas station with automotive repair
- WSP completed a subsurface investigation, an ARMS, and waste characterization for demolition and waste disposal
- Prepare regulated material abatement and remedial action bid specifications
- Provide full-time oversight of the trade contractor's work and adherence to the bid specifications
  - Sewer gas sampling ongoing

the subsurface of the urban landscape. WSP evaluated hydraulic conductivity, temperature, moisture content, VOC concentrations and gradients, and flux which included sampling of soil, groundwater, and mature vegetation and evaluating the sample data.

**File Review, ARMS, and Waste Characterization** – WSP began work at the Site by completing a historical records search and review to identify site use history and suspect regulated materials. Upon completing the historical records review, WSP identified historical use of USTs, UHLs, and automotive repair activities as potential sources of contamination at the Site. During the ARMS, WSP identified 21 suspect asbestos containing materials (ACMs), collected 57 bulk asbestos samples, collected three non-asbestos samples, and incorporated historical sampling results. Based on the ARMS results the following were identified, 10 ACMs, two UHLs, one UST fill port, two listed 1,500-gallon USTs, polychlorinated biphenyls (PCB) containing light ballasts, and universal wastes (electronics and light tubes). The ARMS sample results did not identify any listed or characteristically hazardous materials. The geophysical survey was inconclusive for USTs; however, multiple anomalies were identified to be possible buried metal objects (small metal containers). The ARMS results were incorporated into the bid specifications prepared by WSP and submitted for advertisement by the Michigan Department of Technology, Management, and Budget (DTMB).

**Subsurface Investigation**- WSP completed seven soil borings to a depth of 20 feet below ground surface, installed one temporary groundwater monitoring well, and installed two soil vapor sampling points using direct push drilling technology. Soil samples exhibited concentrations of petroleum related VOCs above Part 201 Residential Criteria at two locations (GP-4 and GP-5), quarterly soil gas sampling exhibited concentrations of VOCs but below the Volatilization to Indoor Air Pathway (VIAP), and quarterly groundwater samples exhibited tetrachloroethene above the VIAP once and then three consecutive events below laboratory method detection limits. Based on the subsurface investigation, soil contamination was near and beneath the existing two-story building.

**Prepare Bid Specifications and Oversight for Demolition, UST and UHL Removal, and Remedial Action** – WSP prepared the bid specifications for the waste removal and disposal and building demolition. WSP provided full-time oversight during the asbestos and regulated materials abatement activities, building demolition, UST and UHL removals, soil removal and disposal, and site restoration activities by the trade contractor. Due to collapsing floor, the second floor of the building could not be safely accessed for asbestos abatement work and the building was demolished as asbestos debris. A total of 148 tons of asbestos waste was removed and disposed. A total of two USTs, two UHLs, and 1,556 tons of non-hazardous soil were removed.

Sewer Gas Sampling Program – WSP completed a monthly sewer gas sampling program from August 2021 through December 2022. The sewer gas sampling program included collecting sewer gas samples each month from within three individual sewer locations selected by the EGLE PM. Sewer gas samples were collected by sealing each sample location with plastic barrier sheeting, allowing for 24-hours to elapse with the seal intact, then collecting samples using dedicated bottle vacs and sample flow regulators. Based on the sewer gas sample results, multiple chlorinated and petroleum related VOCs exhibited concentrations above the Site-Specific Volatilization to Indoor Air Criteria Unrestricted Residential and Restricted Non-residential. EGLE is in the process of evaluating the sewer gas results to develop a possible corrective plan of action.

## 17627 Conant Street

Key Personnel: Garret Bondy, Douglas Saigh, Michael McGowan, Lindsey Selvig Project Address: 17627 Conant Street, Detroit, Michigan Contact Name and Telephone: Beth Vens, EGLE Remediation and Redevelopment Division; (586) 753-3700

#### Relevance to Work Requested in RFP:

- Wayne State CURES Pilot Program Support
- · File Review and Data Evaluation
- Regulated Materials Survey and Waste Characterization
- Prepare Bid Specifications
- Regulated Materials Abatement and Building Demolition
- Subsurface Investigation
- Sewer Gas Sampling Program

**Description** – The Site historically was developed for residential and commercial uses since at least 1926. The commercial uses included a grocery store, shop and garage, laundry, and dry cleaners. The Site was also listed under multiple addresses including 17429 Conant Street, 17605 Conant Street, 17615 Conant Street, 19619 Conant Street, and 17627 Conant Street. The historical grocery store and dry cleaner Site uses were listed under the 17605 Conant Street address and the shop/garage and laundry Site use was listed under the 17619 Conant Street address. The Site became abandoned in the 2000s and the City of Detroit acquired ownership through tax reversion. As part of the City of Detroit's due diligence, the City of Detroit completed a Phase I Environmental Site Assessment (Phase I ESA) and a Phase II ESA which identified soil and shallow groundwater contamination beneath the building footprint.

WSP was contracted in 2019 to complete a pre-demolition asbestos and regulated materials survey (ARMS), waste characterization, prepare regulated materials abatement and demolition specifications, and continue with site subsurface investigation to delineate and evaluate the soil, groundwater, soil gas, and sewer gas migration pathways.

**CURES Pilot Program Support** - WSP collaborated with State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) and Wayne State University in support of The Center for Urban Responses to Environmental Stressors (CURES) Pilot Project Program examining the vapor mobility of volatile organic compounds (VOCs) in the subsurface of the urban landscape. WSP evaluated hydraulic conductivity, temperature, moisture content, VOC concentrations and gradients, and flux which included sampling of soil, groundwater, and mature vegetation and evaluating the sample data.

File Review, RMS, and Waste Characterization - WSP began work at

the site by completing a historical records search and review to identify site use history and suspect regulated materials. Upon completing the historical records review, WSP identified spill records relating to the former dry cleaner activities indicating a potential source of the soil and groundwater contamination discovered at the site. During the ARMS, WSP identified 20 suspect asbestos containing materials (ACMs), collected 26 bulk asbestos samples, collected 28 non-asbestos samples, and incorporated historical sampling results. During the ARMS listed hazardous waste was identified based on documented spill information obtained during the historical records review. WSP prepared a line of evidence report for review by the EGLE Materials Management Division (MMD) to show the listed hazardous waste was identified and delineated. WSP included information from the United States Environmental Protection Agency (USEPA) Region 5, EGLE Remediation and Redevelopment Division, EGLE MMD, and City of Detroit to provide an acceptable agreement on the delineation of listed hazardous waste within a section of



#### Project Highlights:

- Former drycleaner with PCE contamination
- WSP completed an ARMS to identify, quantify, and sample suspect ACMs and other <u>hazardous materials</u>
- Prepared a Line of Evidence report to define hazardous waste limits.
- Prepare regulated material abatement and building demolition bid specifications
- Provided full-time oversight of the trade contractor during demolition and disposal.
- Subsurface environmental investigation.
- Sewer Gas Sampling Program

concrete block wall. The ARMS results were incorporated into the bid specifications prepared by WSP and submitted for advertisement by the Michigan Department of Technology, Management, and Budget (DTMB).

**Prepare Bid Specifications and Oversight for Regulated Materials Removal and Demolition** – WSP prepared the bid specifications for the waste removal and disposal and building demolition. WSP provided full-time oversight during the asbestos and regulated materials abatement, building demolition, and waste disposal activities completed by the trade contractor. The asbestos and regulated materials abatement included removal of 62 cubic yards of asbestos waste and removal of universal wastes (fluorescent light ballasts and light tubes, mercury switch ampoules, and aerosol cans). The listed hazardous waste disposal included a 35-foot section of concrete block wall totaling 20 cubic yards. The building demolition debris totaled 232.63 tons. The building floor slab and footing were left in-place as a barrier to subsurface contaminated soils and groundwater.

**Subsurface Investigation**- WSP completed 38 soil borings to depths ranging from 25 feet to 50 feet below ground surface, installed three temporary groundwater monitoring wells, and installed three soil gas sampling points using direct push drilling technology. Soil and groundwater samples exhibited concentrations of chlorinated VOCs above Part 201 Residential Criteria at several onsite locations within the east adjacent public alley. Soil gas sample results consistently exhibited concentrations of tetrachloroethene above the Volatilization to Indoor Air Pathway. EGLE is in the process of evaluating the soil, groundwater, and soil gas results to develop a possible corrective action plan; however, significant remedial costs relating to listed and characteristically hazardous waste pose a financial concern.

Sewer Gas Sampling Program – WSP completed a monthly sewer gas sampling program from August 2021 through December 2022. The sewer gas sampling program included collecting sewer gas samples each month from within six individual sewer locations selected by the EGLE Project Manager. Sewer gas samples were collected by sealing each sample location with plastic barrier sheeting, allowing for 24-hours to elapse with the seal intact, then collecting samples using dedicated bottle vacs and sample flow regulators. Based on the sewer gas sample results, multiple chlorinated and petroleum related VOCs exhibited concentrations above the Site-Specific Volatilization to Indoor Air Criteria Unrestricted Residential and Restricted Non-residential. EGLE is in the process of evaluating the sewer gas results to develop a possible corrective plan of action.

### LLRW Excavation and Disposal Cell Cover Construction, Alameda Naval Air Station

Key Personnel: Jeff Lively Project Address, City, State, Zip: Alameda, California Contact Name and Telephone: Cecily Sabedra, 619-524-4569

#### **Relevance to Work Requested in RFP:**

- · Investigation of 15 ha area
- · Monitoring of landfill containing radioactive waste
- · Wetland restoration
- Remedial design
- · Construction oversight

**Description**— The site is located within the San Francisco (SF) Bay Area in a commercial, industrial, and residential setting. Operations began in 1943 as a Navy waste disposal site for solid/liquid wastes from plating, paint stripping, aircraft repair, fueling/engine testing, vehicle servicing, pest control, and fire response training. Wastes included radiological wastes in soils from radium-containing paint residues, petroleum hydrocarbons in soils, and a plume of groundwater containing volatile organic compounds (VOCs). The site was listed as an United States Environmental Protection Agency (USEPA) Superfund cleanup site in 1999. The Navy and the City of Alameda developed plans to return the site to the City.

Scope– Under contract with the Navy, WSP performed radiological surveys using our proprietary Orion ScanPlotSM survey system to assess landfill content; designed and constructed a waste isolation cover (WIC); excavated wastes and coordinated disposal of low level radioactive waste (LLRW) with the disposal contractor; designed and constructed a waste isolation barrier (WIB) to contain wastes and maintain waste integrity from risk of seismic activity and proximity to SF Bay; treated contaminated groundwater; delineated an area with significant petroleum hydrocarbon soil contamination; relocated wetlands (considering impacts to wildlife, including potential endangered species); and maintained the integrity of a Historic Landmark (a Training Wall) in nearby Oakland Harbor.

Areas of Responsibility– WSP was the prime contractor responsible for program/project management, Quality Assurance/Quality Control, health and safety, radiation protection and controls, workplan preparation, schedule and cost control, data management, subcontractor and vendor/materials procurement and management, remedial design to support construction (including value-engineering), radiological and ordnance scanning/reporting, and regulatory/stakeholder interaction. WSP assisted the Navy with significant stakeholder interaction from the City of Alameda and multiple federal and state regulatory agencies. Subcontracted work (about 50%) included earthworks, excavation, transportation and disposal, laboratory analysis, radiological technicians, and material





#### Project Highlights:

- Size: 15 ha within 323 ha former Alameda Point Naval Air Station Facility Types: Landfill, Hazardous waste treatment storage/ disposal facility, Shoreline and underwater area
- Affected Media: Soils, Sediments, Groundwater, Air, Sludge, Surface Scope: Preparation of work documents, Designed/ constructed waste isolation cover and waste isolation barrier, Remedial site characterization including radiological surveys, Implementation of radiological controls, Remedial design/actions, Remedial systems O&M, Storage and handling of waste materials, Sampling and analysis, Reporting Contaminants: Radium-226 (Gamma emitting radionuclides -NORM, TENORM), Hazardous contaminants, Petroleum (benzene, oils and lubricants, VOCs (PCE, DCE, TCE, VC, toluene, ethane), Ordnance, Metals Complexity: Lack of operational
- records regarding contamination releases; seismically active area adjacent to SF Bay; historic structure protection.

supplies. WSP subcontracted soil excavation, civil services associated with landfill cover construction, surveying, and analytical laboratory services.

#### **Key Technical Features**

**Design**: WSP prepared ten project plans and submittals for review and acceptance, including: Mobilization Plan, Health & Safety Plan, Accident Prevention Plan, Construction Quality Control Plan, Sampling and Analysis Plan, Waste Management Plan, Stormwater Pollution Prevention Plan, Remedial Action and Radiological Work Plans.

As a groundwater and seismic stability control measure, we designed a WIB (30, 60, and 90%) to stabilize a former burn area originally planned for waste/soil excavation. The WIB used an innovative value-engineering alternative of interlocking sheet piles driven 15 m into the subsurface, creating isolation cells along the interface of the burn area with SF Bay. This mitigated contaminated groundwater flow to the SF Bay, allowed wastes to be left in place, and provided seismic stability to hold the burn waste in place. This value-engineered solution saved \$26M, reduced the schedule by 3 years, and reduced greenhouse gas emissions by 21 million pounds by eliminating excavation and truck transport of radiologically contaminated soil. WSP also implemented 20 design changes for varying conditions.

**Remediation**: WSP set up on-site operations that included eight trailers for offices, break rooms, storage, & on-site rad lab; laydown, staging, storage and stockpile areas; 3,700 meters (m) of barriers; access controls; and step-in/step-out features. We set up four levels of security at the site, main site entrance secured by Navy; project site, Radiological Control Area, and Radioactive Materials Area secured with fences, locked gates, guards, and security cameras. We also constructed haul roads.

Waste was excavated in long strips along the edge of SF Bay and Oakland Inner Harbor and relocated to the center of the landfill to minimize use of off-site material and to create a foundation using existing materials. We value-engineered and constructed a 13.5 ha WIC over former waste disposal cells to protect human and ecological receptors. Prior to placing the soil cover, radiological screening was completed on the pre-final surface and waste material exceeding two times background readings was surgically removed, characterized, photographed, and placed in containers within 200-litre drums for off-site disposal. The WIC consisted of placing 1 m of clean material into two excavations to "countersink" it into the cover. This resulted in a lower final elevation and created a new wetlands area to replace that destroyed during the remedial action. The value-engineered WIC design reduced cover thickness and saved \$250K.

Shoring was designed and constructed to allow excavation adjacent to the SF Bay to about 5 m below ground surface while hazardous, toxic and radiologically impacted soil and debris were removed in long strips and relocated to the center of the waste storage area to minimize use of off-site material and to create a foundation for the WIC.

WSP sorted/segregated waste using a mini excavator, bobcat, shovels, and soil strainers. Discrete radiological material was characterized, packaged and labeled with characterization data, and placed in 200-litre drums.

Based on the original plan to excavate and remove the contaminated material, our innovative WIB installation approach eliminated excavation and truck transport of radiologically contaminated soil. We used our innovative Orion ScanPlotSM radiological screening tool where after each 0.3-m lift, a vehicle-based radiological array surveyed the ground surface. This real time waste characterization and excavation process facilitated accurate separation of radiological and non-radiological wastes, minimizing the volume of waste we sent off-site.

WSP also installed 80 groundwater monitoring wells for regular sampling and analysis at the on-site lab for radionuclide contamination. This allowed for assessment of off-site groundwater flow. Surface water was controlled using stormwater best management practices to eliminate impacts to the SF Bay and the Oakland Inner Harbor.

Disturbed areas were backfilled with clean material following final status survey verification that cleanup objectives for IR Site 1 had been met. The final WIC was restored using seeding and hydromulching. Exposed sand areas within the revetment were covered with new materials.

### Alpena Hide and Leather – Remedial Investigation/Feasibility Study, PFAS Pilot Study

Key Personnel: Garret Bondy, Michael McGowan, Sean Gormely, Len Mankowski, Steve Murray, David Woodward, Nate Peck, Jason Grahn

Project Address: 809-817 W. Miller Street, Alpena, Michigan, 49707 Owner/Client Contract Contact Name and Telephone: Janice Adams; EGLE; (989) 705-3434

#### **Relevance to Work Requested in RFP:**

- Geophysical Investigation (surface and downhole)
- · Soil and Groundwater Investigation (including bedrock)
- Statistical risk assessment
- · Deep well abaondonment
- Groundwater surface water interface (GSI) hydrologic assessment
- · Feasibility study
- Pilot study using innovative per- and polyfluoroalkyl substances (PFAS) immobilization technology
- Remedial design and construction oversight
- · Working with municipalities and landowners
- · Community Relations

**Description**—WSP developed a work plan for a phased remedial investigation (RI) to characterize this former tannery site and neighboring tanning chemical production facility that closed in the 1950s. Historical tanning operations were centered on five parcels, a neighboring active railroad corridor, an adjoining soccer field, and City-owned easements upstream of the Ninth Street Dam (Thunder Bay River). The RI covered an approximately 20-acre footprint. In addition to former tannery operations, additional concerns at the Site include a former bulk fuel terminal (1930-1950s) and a 2005 fire that leveled the former 116,500 square foot building. Known underground utilities include sanitary sewer, storm water, municipal water, gas, electric and fiber optical lines.

WSP successfully characterized soil and groundwater source areas through a combination of geophysical investigations, historical record searches, field soil vapor/non-aqueous phase liquid (NAPL) screening and direct soil and groundwater sampling to identify residual source and buried hide areas (subsequently removed), without incident. WSP prepared a focused feasibility study (FS) and has begun to implement targeted interim response measures (IRMs), to prevent unintended exposure and advance the Site toward closure.



#### Project Highlights

- Identified novel sorptive technology for source area/passive remediation barrier application to immobilize PFAS in groundwater
- PFAS Treatability Study Research and Development.
- EM-31 survey identified potential source areas/former utility corridors to focus investigation.
- Employed phased RI approach to eliminate COPCs and reduce project analytical costs.
- Negotiated access/investigated active railroad corridors and City road right of ways.
- Designed and utilized field filtration system for collected water during excavation activities saving \$30,000 in disposal costs

**Remedial Investigation**—WSP's approach for this large site was to ensure sample coverage/risk characterization across the site and provided more densely spaced characterization in targeted/identified Areas of Concern (AOCs). In order to reduce laboratory analytical and field data acquisition costs and meet data quality objectives, a phased approach was adopted:

Coordinate Stakeholder Involvement – WSP and EGLE teamed to proactively engage and inform the City of Alpena, Alpena Community College, the Alpena Schools Booster Club, Lake States Railroad and adjoining commercial property owners to secure access and accommodate use requirements (e.g., soccer field) to secure access and minimize disruption.

Identify AOCs: Combined historical information (e.g., Sanborn Maps), Site reconnaissance (real-time field GPS of existing utility and boring locations) and geophysical survey (WSP equipment and personnel). Where possible, chemicals of potential concern (COPCs) unique to each AOC were identified to limit laboratory costs.

Utility Assessment/Investigation: Geophysical survey results and catch basin inspections were used to cost effectively rule out current or historical direct storm water connections to the Thunder Bay River reservoir as part of Site characterization activities.

Direct Sampling: Geophysical survey results were also used to pre-clear boring locations for subsurface investigation (reducing drilling-related costs) and enhancing safe project delivery. The State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) identified the removal of any buried hide areas as a Site priority. Data quality objectives in the work plan specified visual evidence of hide material as a means to identify impacted areas and reduce analytical costs. Additional characterization between identified AOCs and limited sampling for the full suite of Site COPCs was performed to assure complete characterization. Field sampling included collection of surface water quality samples (e.g., hardness and pH) as part of characterization activities to reduce subsequent mobilizations but ensure risks could be adequately assessed.

Field Screening - NAPL: WSP used a combination of analytical sampling (EGLE 2014 guidance) and visual and shake tests to assess soils for residual NAPL during site-wide characterization activity that included multiple other COPCs (e.g., metals). Results were used to set and gauge product monitoring wells to ensure mobile NAPL was not present on the water table.

GSI Assessment - WSP has established a monitoring well network that allows lateral and vertical characterization of groundwater flow adjacent to the Thunder Bay River. Vertical hydraulic gradients and potentiometric surface mapping suggests the reservoir is a losing system that directs groundwater flow away from it. GSI assessment has included working with the City of Alpena to assess and sample storm water infrastructure that may be in contact with the water table and to map the complex hydrologic relationships at the Site.

Bedrock Characterization and Artesian Well Abandonment—WSP measured/logged natural gamma radiation immediately prior to abandonment of a leaking 604 feet deep, artesian (flow at up to 400 gallons per minute) bedrock well discovered on the Site. The gamma logging results were used to identify potential permeable lenses and aquitards in the shallow limestone system to identify depositional system where natural horizontal fractures (i.e., bedding) and or porosity may occur. This allowed for successful execution of well plugging and abandonment, and also allowed efficient, vertically targeted monitoring well installation to vertically assess groundwater impacts and the complex hydrology of the Site.

**Feasibility Study & Interim Remedial Action/Soil Excavation**—The FS focused on soil and groundwater presumptive remedies for waste-in-place and remedies compatible with concurrent site development to limit the scope and costs of the feasibility assessment and address the identified risk exposure pathways. Areas of buried animal hide were identified and an interim response action was deemed warranted. Over 5,200 tons of soil were removed and disposed. Excavation extended below the water table and dewatering of over 60,000 gallons of water. WSP designed a field filtration system to meet City of Alpena waste water treatment plant requirements, that saved over \$30,000 in disposal costs.

**Civil Design and Construction Oversite**—WSP civil engineers designed a storm water management system including grading plan, paving design, and connection to City storm sewer to limit stormwater infiltration into PFAS impacted soils at the Site. WSP provided field oversite of trade contractor hired by the State of Michigan for EGLE.

**PFAS Treatability Study Design & Pilot Study**—WSP and EGLE identified PFAS as additional COPCs in soil and groundwater. Extensive groundwater, soil and surface water sampling was performed to characterize PFAS. WSP identified a potential in-situ remedy and collaborated with ORIN Remediation to assess a new immobilization technology that enhances soil cation exchange capacity to allow impacted soil to be treated in-place. WSP conducted a treatability study and small-scale pilot test to assess whether a proprietary biochar (BAM<sup>™</sup>) can effectively immobilize and reduce concentrations of PFAS in the subsurface (soil and groundwater) to levels that will attenuate over time (below GSI criteria) and reduce potential impact to the Thunder Bay River and nearby storm water conveyances. The treatability test reduced perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) concentrations in groundwater and soil to below GSI criteria. The pilot test included a soil mixing and direct injection option and is on-going. The pilot test will assist in determining the long-term effectiveness of the media and verify whether the benchtop loading rates are sufficient to achieve remedial goals when implemented in the field.

## **Broadway Coin Laundry**

**Key Personnel:** Garret Bondy, Nick Rogers, Michael McGowan, Megan Cynar, Steven Murray, Justin Gal, Leonard Mankowski, Deanna Hutsell, Nate Peck

Project Address, City, State, Zip: 1120 Broadway Street, Ann Arbor, Michigan 48105

Contact Name and Telephone: Ashley Lesser, EGLE Remediation and Redevelopment Division; (517) 285-6324

#### **Relevance to Work Requested in RFP:**

- Environmental Investigation/Characterization
- · Geophysical Studies
- Vapor Intrusion Investigation and Pilot Study
- Brownfield Development
- Assisted the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) in evaluating protectiveness of developer's mitigation plans

Description—In 1961, the Broadway Coin Laundry site was a coin laundry building and drycleaner building that utilized tetrachloroethylene (PCE) in their cleaning process. Former buildings were demolished sometime after 2002 and EGLE subsequently completed a limited site remedial investigation (RI) including soil, soil gas, and groundwater investigations that extended off-site. The areas of the former laundry and drycleaner buildings were identified as source areas. WSP was contracted to develop a limited site investigation, evaluate the groundwater surface water interface (GSI), and evaluate site characteristics for a permeable reactive barrier (PRB) wall to reduce PCE concentrations in groundwater.

**Environmental Investigation/Characterization**–WSP conducted site investigation activities to delineate the extent of PCE and associated chlorinated volatile organic compounds. Contaminant fate and transport was assessed for possible distribution into nearby water bodies (Taver Creek and Huron River), and the shallow and deep groundwater systems. This possible distribution was used to assess the risk to the GSI. Vertical aquifer sampling (VAS) borings were advanced to varying depths of the groundwater system to characterize groundwater/soil and define contamination plume extent. There are 15 VAS cluster locations, each with several 1-inch piezometers installed at different depths. This cost-effective cluster method contains 1-3 piezometers per location; piezometer depths ranged from 7-38.5 feet below ground surface (ft BCS). There were



Project Highlights:

- Site was a former coin laundry
  and drycleaner with PCE
  contamination
- WSP conducted a limited site investigation and evaluated CSI to delineate PCE contamination
- Utilized VAS borings, soil samples, and groundwater samples to delineate plume
- Assisted the EGLE with redevelopment of the property by evaluating the site characteristics for a PRB wall to reduce PCE concentrations in groundwater

nine offsite VAS cluster locations with 2-4 piezometers installed from 5-39 ft BGS. WSP had to obtain Washtenaw County Health Department Soil Boring Permits to complete this scope of work. Additionally, Monitoring Well permits were required for all wells installed offsite on private properties. Field efforts also included redevelopment of existing groundwater monitoring wells, installation of additional monitoring wells using sonic drilling, and sampling the wells to further evaluate the contamination extent. Proper decontamination and disposal of investigative derived waste (IDW) were carried out throughout this investigation.

Geophysical Studies– Designed and implemented a series of geophysical profiles (resistivity/induced polarization (IP) profiles) on- and offsite to define preferential migration pathways in upper aquifer/discontinuities in the intervening (partially confining) silt. The survey included the use of use resistivity/IP survey methods to capture the aquifer structure. The geophysical study was completed along transects to survey the downgradient property boundary, downgradient of the previous EGLE investigation area, near Taver Creek and Huron River, and near the source areas. The placement of the VAS borings were determined by the geophysical survey results.

**Brownfield Development**–The site and surrounding properties were purchased by Morningside Equities Group, Inc. (Morningside), utilizing brownfield funding. Morningside is redeveloping the property for residential use. WSP provided engineering evaluation of Morningside's 381 Work Plan, PRB wall, source area reduction remedies, and pilot study.

Vapor Intrusion Investigation and Pilot Study–The conceptual site model was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete Volatilization to Indoor Air Pathway (VIAP) at existing multi-residential apartments and PCE venting to Traver Creek and the Huron River. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of sub-slab depressurization systems. Implemented ongoing evaluation of vapor intrusion pathway related to shallow groundwater. Conducted pilot testing using PlumeStop<sup>™</sup>. Conducted engineering evaluations and oversight of pilot testing being performed by the site developer to mitigate source area and control offsite migration of impacted groundwater with PRBs and injectable carbon-based media. WSP is currently conducting quarterly soil vapor and groundwater monitoring to assess performance of the pilot study and evaluate potential additional downgradient investigation and remediation.

# Cal's Car Care

**Key Personnel:** Garret Bondy, Michael McGowan, Doug Saigh, Justin Gal, Deanna Hutsell **Project Address:** 202 West Main Street, Northville, MI **Owner/Client Contract Contact Name and Telephone:** Eric Larson, EGLE, 586-255-6196

#### Relevance to Work Requested in RFP:

- Free Product Survey/Abatement
- Ground Penetrating Radar (GPR)
- Phase I/Phase II Environmental Site Assessment
- Environmental Drilling/Well Abandonment
- Environmental Investigation/Characterization
- Off-site Vapor Intrusion Investigation
- Underground Storage Tank Soil Excavation
- Remediation Systems Evaluation
- Vapor Intrusion Mitigation Design and Operation and Maintenance (O&M)
- Brownfield Redevelopment

**Description**—The former Cal's Car Care site is located in an area of mixed commercial, municipal, and residential land use in downtown Northville, Michigan. At various times from 1942 to 1993, the property was the location of a gasoline station, an auto-body repair shop, a car wash, and a dry-cleaning business. When the underground storage tank (UST) system was removed in 1993, petroleum-impacted soil and groundwater were discovered. Light nonaqueous-phase liquid (LNAPL) petroleum was present, and a plume of petroleum-related volatile organic compounds (VOCs) in groundwater extended 500 feet off-site. Subsequent investigations by the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) (formerly Michigan Department of Environmental Quality (MDEQ)) showed that chlorinated solvents used in dry-cleaning operations were comingled with the petroleum-related compounds in soil and groundwater. WSP worked closely with EGLE and affected property owners to identify and control potential public health risks posed by the contamination. Ultimately, the primary exposure pathway of concern both on-site and off-site was the volatilization to indoor air pathway (i.e., vapor intrusion).

When the on-site building was renovated as a restaurant in 2012, a vapor barrier and passive sub-slab vapor ventilation system were incorporated into the design with funding from the State's brownfield-redevelopment incentives program. EGLE's surveillance monitoring revealed VOC concentrations exceeding State of Michigan screening levels for nonresidential indoor air. WSP quickly identified the causes of the mitigation system's failure, recommended a combination of operational changes and system





#### **Project Highlights**

- Evaluation of indoor air and effectiveness of passive mitigation system
- Comingled petroleum and chlorinated-solvent releases at bust downtown intersection.
- Soil vapor investigations used to identify source area and assess potential vapor intrusion risks.
- Nearby properties impacted by groundwater contamination and VOCcontaminated soil vapor.
- Complex hydrogeology made plume-tracking a challenge.
- Existing remediation systems required performance evaluation and abandonment or improvement.

modifications, and implemented these interim actions to reduce vapor intrusion to the building. Postimplementation indoor air monitoring confirmed their effectiveness. WSP also recommended revisions to the system's O&M plan and/or to the facility's due care plan to prevent similar conditions from developing the future.

**Free Product Survey/Abatement**—WSP monitored LNAPL released from gasoline and waste-oil tanks by measuring thickness in monitoring wells and recovery wells. Laboratory analysis of LNAPL samples from on-site and downgradient properties was used to distinguish multiple sources. Evaluation of

LNAPL petroleum products at the water table near the on-site UST excavation area, under adjacent roadway, and on off-site properties showed it was mobile but no longer migrating. Monitored LNAPL thicknesses and coordinated LNAPL removal by vacuum-truck, as needed, until it gradually dissipated. Installed large-diameter sump during site redevelopment to allow continued LNAPL monitoring and recovery following abandonment of all on-site monitoring and extraction wells. Sump finished at surface to blend with landscaping.

**Ground Penetrating Radar (GPR)**—Completed a geophysical survey on exterior of the building and accessible portions of interior using electromagnetics, magnetometry (MAG); and ground penetrating radar (GPR). Identified several anomalies signifying potential presence of tanks, piping, utilities, former excavations, and/or old foundations. One anomaly interpreted to be abandoned UST given size, shape, and intensity of the geophysical signature. Others signified piping or abandoned utility lines.

**Phase I/Phase II Environmental Site Assessment**—Reviewed Sanborn maps, aerial photos, and other historical records to identify potential contamination sources on and near the site. Discovered previously-unknown former dry cleaning operation as the likely source of chlorinated solvent compounds in soil and groundwater. Additional investigation done to delineate extent of contamination, including soil, groundwater, soil vapor, and indoor air sampling on-site and adjacent properties.

**Environmental Drilling**—Installed monitoring wells using hollow-stem auger and direct-push methods to monitor plume migration and identify off-site properties potentially at risk from vapor intrusion. Some wells used for vertical profiling of contaminant concentrations within the aquifer.

Well Abandonment—Compiled well-construction details and prepared required documentation to properly abandon unneeded off-site groundwater monitoring wells. Oversaw removal and/or plugging of on-site monitoring wells, LNAPL recovery wells, and soil vapor monitoring points during site redevelopment. Provided required documentation for project record.

Environmental Investigation/Characterization—Characterized hydrogeology and contaminant distribution on-site and off-site in groundwater, soil, soil vapor, and indoor air to assess potential risks to human health and the environment. Identified source areas using direct and indirect methods. Drilled direct-push borings with laboratory analysis of soil and groundwater samples to characterize horizontal and vertical distribution of contaminant on-site and downgradient. Deployed GoreSorb® sub-slab and near-slab to identify on-site chlorinated-solvent source area; deployed off-site to locate leading edge of plume and select locations for permanent vapor monitoring points. Following passive soil vapor survey, installed vapor monitoring points at 5-foot depth and just above capillary zone near occupied commercial, residential, and municipal buildings to assess need for further evaluation of potential indoor air risks. Installed temporary sub-slab soil vapor monitoring points (Vapor Pins™) in on-site and off-site buildings to determine contaminant concentrations in soil vapor for comparison with screening levels. Collected guarterly soil vapor and indoor air samples for TO-15 analysis in accordance with EGLE protocols. Removed/abandoned on-site monitoring wells and soil vapor monitoring points in conjunction with site redevelopment. Used parts per billion-level photoionization detector for screening-level investigation of indoor air and identification of vapor-entry points in basement of on-site building. Created database of boring logs, water level data, and contaminant concentrations for 3-D visualization of hydrogeochemical conditions from source area to downgradient edge of plume using GIS/EVS software. Model revealed exceptionally complex system of coarse and fine glacial (endmoraine) deposits incised by outwash channels, transitioning to alluvial deposits in present-day stream valley.

**Underground Storage Tank (UST) Soil Excavation**—Excavated former dispenser area to locate and remove buried piping and impacted soil, if any. Identified former dispenser area (pump island) from historical photos, marked in field, and procured qualified equipment operator. Pavement was saw-cut and backhoe used to excavate soil to a depth of 8 feet. Confirmed underground piping removed from dispenser area during previous tank removal and system decommissioning. Additional excavations were done to identify subsurface anomalies from geophysical survey.

**Remediation Systems Evaluation**—Conducted engineering evaluation on multi-phase LNAPL recovery system that had not been operated for 20 years. Most components had deteriorated beyond repair and

rehabilitation/restoration not cost-effective. Recommended deconstruction. System removed and recovery wells properly abandoned.

Vapor Intrusion Mitigation Design and O&M—Evaluated design, operation, maintenance, and monitoring of existing vapor intrusion mitigation system for effectiveness in meeting mitigation objectives. Evaluation showed vapor barrier and passive sub-slab ventilation system was not performing as intended. Inspection of aboveground system components followed by vapor intrusion assessment in building identified unbalanced kitchen ventilation system, uncapped sampling ports, and unsealed joints in foundation as primary causes of high volatile organic compound concentrations in building. Recommended and implemented operational changes and mitigation system modifications, including conversion of passive soil vapor collection zone to active sub-slab depressurization, reduced maximum indoor air concentrations of primary contaminant by 98%.

**Brownfield Redevelopment**—Coordinated environmental assessment work with construction contractors during renovation of building for use as restaurant. Supported client during grant-funded design and construction of vapor intrusion mitigation system and interactions with local government, the property owner, contractors, and state brownfield-program representatives.

# Collett Dump Site

Key Personnel: Jason Armstrong

Project Address: Corlett Drive, Brighton Township, Michigan Owner/Client Contract Contact Name and Telephone: Charles Barbieri; Foster Swift; (517) 371-8155

#### **Relevance to Work Requested in RFP:**

- Environmental Investigation (groundwater and methane)
- Environmental Drilling and Well Abandonment
- Landfill Maintenance & Monitoring
- · PFAS
- Subcontractor Oversight
- · Vapor Intrusion Assessment

**Groundwater & Methane Sampling Plan Development**–WSP developed detailed groundwater and methane sampling plans to outline proposed activities to meet the project objectives and to comply with the requirements of an agreed upon Consent Decree (CD). These plans described the quality controls, quality assurance, sampling protocol, and chain of custody procedures used to carry out the response activities outlined in the CD.

**Groundwater Investigation Monitoring**–WSP performed groundwater investigation and monitoring activities in accordance with the approved Groundwater Monitoring Plan and the requirements of the CD. Upon receipt of the analytical data, WSP compiled and analyzed the analytical data and summarized the results in its routine progress reports. In addition, WSP also compiled and analyzed groundwater elevation data from its groundwater monitoring events and prepared groundwater



Project Highlights:

- Performed groundwater and methane investigations to ensure protection of sensitive environmental receptors from exposure to contaminants originating at the site.
- Evaluated vapor intrusion risks to nearby residential structures.
- Successfully completed each of the tasks required to meet the project objectives and to comply with the agreed upon Consent Decree.

elevation contour diagrams for each of the three separate groundwater bearing zones identified in its conceptual site model. WSP analyzed the groundwater flow data in relation to on-site and off-site environmental receptors to assess the potential risk that the impacted groundwater posed to these receptors. WSP also evaluated the groundwater data and assessed vapor intrusion risks to dwellings on adjacent properties.

**Methane Investigation & Monitoring**—WSP investigated potential methane generation from the dump beneath the site and its potential impact to the site and surrounding properties. This investigation consisted of drilling and installation of soil gas monitoring probes, and routine monitoring of the probes to identify the presence of methane beneath the site. Following completion of the methane investigation and monitoring, WSP abandoned the soil gas monitoring probes and summarized the results of its investigation in its routine progress reports.

Monitoring Well Abandonment—Pursuant to the requirements of the CD, WSP abandoned a total of 31 groundwater monitoring wells formerly associated with historic investigations conducted at the site. WSP provided subcontractor oversight of the well abandonment activities and ensured that each well was abandoned in accordance with the CD requirements.

**Implement Institutional Controls and Land Use Restrictions**—WSP developed and filed a Restrictive Covenant that prohibits the construction of structures on the property and prohibits the use of groundwater at the site. The Restrictive Covenant was filed with the Livingston County Register of Deeds office. WSP also assisted with the development a groundwater use restriction ordinance for the municipality to incorporate into its Master Plan and zoning regulations. This multi-parcel groundwater use restriction was eventually adopted by the municipality.

**Inspecting and Maintaining Security Fencing and Soil Cover**—WSP routinely inspected the security fencing surrounding the site and coordinated maintenance of the fencing on an as-needed basis. In addition, WSP also routinely inspected the soil cover at the site and coordinated soil cover maintenance

activities to protect site occupants from exposure to contaminants and refuse in the subsurface. The results of WSP's inspection and maintenance activities were provided to the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) in the routine progress reports submitted for the site.

Drinking Water Sample Sampling and Data Evaluation—WSP assisted the Livingston County Department of Public Health with coordinating a residential drinking water sampling program to assess the potential for contaminant migration beneath the numerous residential properties surrounding the site. Upon receipt of the analytical data, WSP evaluated the sampling results and prepared letters to property owners explaining the analytical results. WSP also evaluated drinking water well logs and residential drinking water sampling results and incorporated the results into its overall conceptual site model.

**Vapor Intrusion Assessment**— WSP evaluated the groundwater data collected at the site and had sitespecific screening levels calculated for the facility. The analytical data obtained during groundwater sampling activities was utilized to assess vapor intrusion risks to dwellings on adjacent properties and any potential future structures constructed on the site. WSP developed and implemented a Contingency Plan which developed "triggers" for additional investigative activities if the groundwater analytical data suggested that there may be potential vapor intrusion risks associated with contaminants in the groundwater beneath the site and surrounding residential properties.

**Progress Reporting**–WSP prepared routine progress reports for submittal to EGLE that outlined the response actions that were conducted to achieve compliance with the CD. These progress reports provided sampling results and an interpretation of the data collected at the site during each reporting period. Progress reports also documented the results of the security and soil cover inspections, and summarized maintenance activities performed to maintain the integrity of the fence and soil cover. Each report provided a description of the nature and extent of soil and/or methane impacts resulting from the historic use of the site as an unregulated dump site.

Per- & Polyfluoroalkyl Substances Sampling—WSP provided observation of EGLE personnel performing groundwater and surface water sampling activities to assess per- and Polyfluoroalkyl Substances (PFAS) impacts at the site and on adjacent properties. WSP provided EGLE sampling personnel with guidance on PFAS sampling protocol and offered suggestions to alter sampling procedures to avoid false detections and potential cross-contamination. WSP also compiled and analyzed the PFAS groundwater and surface water data collected by EGLE and incorporated the results into its overall conceptual site model.

**Compliance with the Requirements of the Consent Decree**—WSP is currently in the process of preparing the final required progress report for the site. This progress report will summarize the activities that it has conducted at the site to meet the project objectives and to comply with the requirements of the CD.

### PFAS Support Services, Confidential Landfill

*Key Personnel:* Garret Bondy, Justin Gal, Shalene Thomas, Dave Woodward, Sean Gormley *Project Address, City, State, Zip:* 21545 W. Cannonsville Rd., Pierson, MI 49339 *Contact Name and Telephone:* Justin Obermeyer, Confidential Client, (616) 431-6173

#### **Relevance to Work Requested in RFP:**

- Per- and polyfluoroalkyl substances (PFAS) Remediation System Pilot Studies
- · PFAS Landfill Monitoring
- PFAS Risk Communication and Public Meeting Support
- PFAS Pump and Treat (P&T) Remedial Design, Construction Oversight, and operation and maintenance (O&M)

Description-In May 2018, WSP started supporting the landfill client with their investigation at the landfill in Michigan to determine the presence of per- and polyfluoroalkyl substances (PFAS). PFAS was identified in several on-site groundwater samples at concentrations above respective United States Environmental Protection Agency (USEPA) drinking water advisories (perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS)). The client next completed a receptor survey and sampled residential wells downgradient of the site. Although some residents had detectable concentrations of PFAS in their drinking water, no samples were detected above the USEPA drinking water advisory levels (70 parts per trillion (ppt) for PFOS & PFOA). Regardless of the detections, the Client and the Department of Health installed Point of Use (POU) or Point of Entry Treatment (POET) Systems on all residents that had detections. A subsequent groundwater investigation is being conducted by a separate contractor on-site to determine if PFAS have migrated further offsite. In addition, the on-site groundwater pump and treat system was sampled for PFAS to determine discharge concentrations. WSP evaluated optimization plans by conducting a pilot study for the existing system to add PFAS treatment to the remediation treatment train and completed a full-scale P&T design in 2021. Construction on the new 150 gallons per minute (gpm) system was substantially complete in March 2022. During commissioning, it was found that the filtration system was inadequate to protect the ion exchange (IX) resin. WSP completed



#### Project Highlights:

- The system uptime improved by over 300% during the initial column study because of the fouling controls WSP engineered and installed for the system. These controls were implemented into the full-scale design
- WSP reacted quickly when the system filtration was failing and immediately conducted trouble shooting and an accelerated pilot study utilizing a clarifier to maximize the system uptime and minimize O&M costs
- Through proper risk
  communication, regular public
  meetings were eliminated
- meetings were eliminated
  Supporting Client by reviewing and conducting data validation on the PFAS RI data has provided
   3<sup>rd</sup> party expertise in helping to steer and navigate the PFAS RI being conducted by others

a subsequent pilot study to determine if the use of a clarifier was a better option for solids filtration. Upon completion of the pilot study, WSP completed a design addendum to incorporate a clarifier into the system process flow. WSP completed the design addendum and the Client is currently conducting procurement to implement the optimized system upgrades.

**Remediation System Column Study**—Samples collected from the on-site groundwater treatment system influent and effluent show PFOS & PFOA exceeding the USEPA health advisory levels of 70 ppt and shorter chain PFAS compounds above Michigan's proposed health-based drinking water values. The system effluent discharges to an adjacent stormwater pond and subsequently infiltrates back into the groundwater. To evaluate potential PFAS treatment upgrades for the system, WSP designed, constructed, and operated an onsite PFAS Treatment Column Study that demonstrated the effectiveness of granular activated carbon and non-regenerable IX resin. In addition, prior to onsite column testing, bench scale studies were completed to select a deposit control chemical that maximized the system uptime by decreasing system fouling during the 3-month study. The system

uptime improved by over 300% during the study as a result of the fouling controls WSP engineered and installed for the system. Based on the study results, we estimated change-out frequencies for both PFAS test media, generated cost estimates to treat PFAS and other chemicals of concern entering the groundwater treatment system and presented our findings to the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) to support our client's remedial schedule and planning considerations. We also summarized our findings in a technical memorandum and presented key components to the client's team and legal counsel.

**Remedial System Design**—WSP prepared a technical report documenting the 30% basis of design to upgrade the groundwater treatment system with solids removal and control pretreatment and PFAS treatment. The design and report selected process flow equipment, evaluated capital and O&M costs, selected the building size and location, drafted the building arrangement, selected piping sizes and materials, prescribed operation parameters, and preliminarily scoped the instrumentation and control configuration. The report and evaluation also provided the anticipated list of 95% basis of design drawings and specifications which would be completed as a subsequent scope of work to move the design towards finalization.

WSP completed the 100% design for the groundwater treatment system and prepared bid specifications to remediate PFAS in groundwater captured from the landfill pumping wells. The system was designed to treat groundwater at 150 gpm, consisting of 3 x 70-cubic feet IX resin vessels for PFAS removal, an air stripper for volatile organic compound removal, and a deposit control and solids management system to maximize system uptime. Our design also included the treatment system building and the controls system to remotely monitor the system.

**Procurement and Construction/Management Oversight**—WSP assisted the client in procuring construction services for the groundwater treatment system. This included pre-bid meetings, addenda, receiving and evaluating bids. During the construction, WSP managed the construction for compliance with the specifications. This also included daily activity reports, issuing bulletins, and commissioning the system.

**Residential Well Sampling**—At the onset of the project, an immediate effort was undertaken by the landfill client to sample all potable water wells located within a defined radius area downgradient of the landfill site. This effort was deemed necessary to address the human health concern and resulted in the sampling of private water wells. Upon receipt of the analytical laboratory results, Stage 2B data validation was performed by WSP's data validation team to ensure sample-specific quality control parameters (blanks, spike recoveries, surrogate recoveries, etc.) and instrument-specific calibration data fell within allotted parameters.

**PFAS Remedial Investigation Support**— WSP is supporting the client's contractor that is conducting the PFAS Remedial Investigation by conducting 3rd party data validation on all of the analytical laboratory results.

**POU and POET System Operation and Maintenance Plans** — WSP prepared Operation and Maintenance Plans for in home POU and POET systems on behalf of the landfill. Plans included standard operating procedures for sampling and filter change-outs based on manufacturer's recommendations.

# **Detroit Refinery**

Key Personnel: Garret Bondy, Michael McGowan, Justin Gal, Nick Rogers, Jeshua Hansen, Nate Peck Project Address: 1200 Zug Island Road, Detroit, Michigan Owner/Client Contract Contact Name and Telephone: Jessica Telano, Confidential Client 973-455-2009

#### **Relevance to Work Requested in RFP:**

- · Demolition of Coal Tar Refinery Plant
- Completed Pre-Demolition Assessment and RMS
- NAPL Delineation Using LIF
- Demolition Design and Oversight of Entire Facility Following Plant Decommissioning
- Demolish One Million Gallon AST
- Off-Site Incineration of 200,000 Gallons of RCRA Hazardous Waste
- · Site Restoration for Redevelopment

**Description**—A century of industrial operations had contaminated soil and groundwater at the 12-acre coal tar refinery along the old channel of the Rouge River. WSP has performed the design and installation of an interim groundwater collection system response, decommissioning and demolition of the plant, a remedial investigation, and the operation and maintenance of the treatment plant. WSP is currently completing the site cover final remedy.

### Interim Remedial Response Design and Installation—While the plant still operated, studies showed contaminants near the river at



#### Project Highlights:

- Oversaw decommissioning and demolition
- Designed and installed hydraulic barrier wall to protect surface water
- Incineration of 200,000 gallons of RCRA hazardous waste
- O&M on existing groundwater system

concentrations that could pose an immediate threat to fish and other aquatic life in the river. Action was needed in the form of an Interim Response Measure to protect the groundwater/surface water interface without impacting site operations. WSP designed and installed a groundwater collection system using Vacuum Extraction Wells to capture groundwater and non-aqueous phase liquid (NAPL) and protect nearby surface water. A vapor barrier was used to prevent vapor intrusion within the Groundwater Treatment Facility built to treat contaminated groundwater before discharging to the Detroit Water and Sewer.

**Demolition Oversight**—WSP prepared specification packages for the demolition and remediation services. The packages specified asbestos abatement, removal of universal waste, hazardous sludge removal, soil removal, backfill and compaction, demolition of buildings and other on-site structures, and soil erosion plans and, as well as debris and waste handling in accordance with the Resource Conservation and Recovery Act (RCRA). Pre-demolition activities included asbestos abatement and removal of universal waste. The demolition involved the removal of site structures over two phases, including multiple buildings, storage tanks, an in-ground oil-water separator, clarifier, a million-gallon aboveground storage tank (AST), and all associated aboveground piping. WSP provided project management and oversight of the contractors. This included the pre-construction meeting, submittal review (e.g., work plans, health & safety plans, schedules, shop drawings, etc.), review and approval of invoices and change orders, managing over 25 subcontractors on-site, documenting contractor's work for compliance with specifications, obtaining permits from the City of Detroit, the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE), and United States Army Corps of Engineers (USACE), signing manifests, and performing air monitoring.

**Off-site Incineration of RCRA Waste**—As part of plant demolition, a one-million-gallon storage tank was demolished. A 200,000 gallon tar heel was removed from the tank bottom. The material was found to be RCRA hazardous and required incineration. WSP characterized the material and obtained approval from an off-site incineration facility to manifest the material to the facility for incineration.

**Remedial Investigations**—Following closure of the plant, WSP conducted a remedial investigation to characterize subsurface conditions and delineate compounds in the subsurface above state generic criteria. WSP conducted a phased remedial investigation including, soil and groundwater sampling

using direct push technologies, and monitoring well installation using both hollow-stem auger and sonic drilling methods. Vertical aquifer sampling was performed to determine vertical delineation of contaminants in groundwater. Elevated concentrations of semi-volatile organic compounds were detected in soil and groundwater, and NAPL was found to be present in the subsurface. WSP performed investigation activities in high-risk areas along an active industrial road with many utilities present and an adjacent railroad line using ground penetrating radar (GPR) and air-knife technologies to investigate near utilities safely. Two pump tests have been performed to assist in determining groundwater aquifer characteristics. Groundwater flow has been modeled extensively to assist in investigation and design of the final remedy.

NAPL Delineation—WSP investigated and delineated the extent of NAPL using multiple lines of evidence that included using historical operational, geologic information, and a tar-specific green optical screening tool (TarGOST®) using Laser-Induced Fluorescence (LIF) technique and direct push borings. Additional direct-push borings were advanced in adjacent industrial/commercial properties to delineate the extent of NAPL off site.

**Feasibility Study**–WSP has also completed a feasibility study for selecting a final remedy. Alternatives such as source removal, containment, in-situ stabilization, and monitored natural attenuation were evaluated. A groundwater containment system (GWCS) was selected as the final site remedy and a Remedial Action Plan was submitted to EGLE.

**Groundwater Containment System (GWCS) Remedial Design**–WSP designed the final remedy to be integrated with the sheet pile wall being constructed along the site to allow sediment dredging in the Old Channel of the Rouge River. The sheet pile wall required to stabilize the shoreline and facilitate dredging of sediments was also designed by WSP. The sheet pile wall consists of 80-90-foot-long steel sheets anchored by a series of tiebacks to a deadmen system. In areas of underground structures such as utility lines crossing the river, or bridge abutments, the sheet pile wall was discontinued and "windows" were created in the wall. The GWCS includes the following components: groundwater collection trenches, a low-permeable grout curtain to seal the joints of the sheet pile wall and an engineered cover system to prevent direct contact exposure to site soils and restrictive covenants. A compatibility test was completed to evaluate performance of various grout mixtures and their compatibility with site contaminants.

**Construction**—WSP prepared specification packages for the construction of the sheet pile wall and the GWCS. WSP procured the construction contractor and provided project management and oversight of the contractor, including the pre-construction meeting, submittal review (e.g., work plans, health & safety plans, schedules, shop drawings, etc.), review and approval of invoices and change orders, documenting contractor's work for compliance with specifications, and obtaining necessary permits. Construction activities included: building a temporary wastewater treatment plant, pre-trenching, demolishing existing structures, abatement of asbestos coating a large unknown pipe encountered in the path of the tiebacks; video camera inspection of an old sewer line to assess feasibility in converting it into a discharge line for the temporary treatment plant; removal/disposal of NAPL encountered within the excavated areas. The interim remedial measure system was decommissioned and replaced by the GWCS.

**Remedial System Operation Maintenance and Monitoring**–WSP is overseeing operation and maintenance (O&M) of the GWCS, including the collection of groundwater monitoring data, and is reported results quarterly to EGLE.

## **Electro-Plating Services**

Key Personnel: Garret Bondy, Michael McGowan, Len Mankowski, Megan Cynar, Nate Peck, Lindsey Selvig, Justin Gal, Doug Saigh

Project Address, City, State, Zip: 945 E. Ten Mile Rd, Madison Heights, Michigan Contact Name and Telephone: Joe DeGrazia, EGLE, 586-291-0476

#### **Relevance to Work Requested in RFP:**

- **Brownfield Redevelopment**
- Vapor Intrusion Investigation .
- Soil Characterization Investigation
- Permeable Reactive Barriers (PRB) Operations, Monitoring, and Maintenance (OM&M)
- Regulated Materials Survey and Waste Characterization
- **Building Demolition Specifications**
- **Building Demolition Oversight** .
- Feasibility Study
- **Source Remediation Specifications**

Description- Electro-Plating Services (EPS) was reportedly incorporated in 1967 and manufactured electroplated metals or formed products at the Site until the Michigan Department of Environment, Great Lakes, and Energy (EGLE) ordered it to cease operations on December 21, 2016. Until that time, EPS conducted various types of electro-plating operations, including copper, tin, bronze, cadmium, nickel, chrome, gold, silver, zinc, and lead plating. EPS operations resulted in the generation and storage of large quantities of hazardous waste, including cyanide, chromium, nickel chloride, trichloroethylene (TCE), and various acids and bases.

On December 20, 2019, green liquid was identified to be leaching onto the eastbound right-of-way (ROW) of I-696 and EGLE requested assistance from the United States Environmental Protection Agency (USEPA). The USEPA conducted an emergency response that included removal of drums and totes containing hazardous materials, recovery of water impacted with chromium from the basement of the building and pressure cleaning the basement. In addition, the USEPA installed an interceptor trench on the I-696 service drive as well as sumps in the basement and along I-696 to collect chromium contaminated groundwater and keep it from migrating into the I-696 ROW and storm water infrastructure.

WSP was contracted in 2021 to complete a pre-demolition regulated materials survey (RMS), waste characterization, prepare regulated materials abatement and demolition specifications, oversee building demolition, prepare a feasibility study to address the source area, and develop bid specifications to remediate the source area.



#### **Project Highlights:**

- Site was a former plating facility with TCE, cyanide, and chromium
- WSP completed an RMS to identify, quantify, and sample suspect asbestos containing materials
- Prepare regulated material abatement and building
- demolition bid specifications Provide full-time oversight of the trade contractor's work and specifications
- Completed a vapor intrusion investigation
- Completed PRB OM&M activities Completed a Feasibility Study to
- address the source area Currently developing bid
  - specifications to remediate the source area

Vapor Intrusion Investigation - WSP completed a vapor intrusion assessment of the site. The vapor intrusion investigation included the installation of eight shallow soil gas wells and three sub-slab soil vapor pins. Installation of wells/pins and sampling was completed in accordance with EGLE's "Guidance Document for the Vapor Intrusion Pathway". The soil gas wells and sub-slab soil vapor pins were sampled quarterly for one year to evaluate the vapor intrusion pathway. Results indicated that the vapor intrusion pathway was relevant and additional evaluation should be completed following source removal activities and prior to redevelopment.

**Soil Characterization/Investigation** – WSP completed a preliminary design investigation to assess the contaminant of concern levels in saturated soil at the site. The investigation was completed to assess the source contaminant mass extent to better apply future permeable reactive barrier operations, maintenance and monitoring and refine the lateral and vertical extent of source area treatment alternatives. The investigation included evaluating nine locations below and/or adjacent to the building. The soil samples were collected from the vadose zone, the saturated zone, and the underlying clay and samples were analyzed for volatile organic compounds (VOCs), Michigan 10 Metals, hexavalent chromium, cyanide, and per- and polyfluoroalkyl substances (PFAS). The results of this investigation were utilized in completing the feasibility study.

**PRB OM&M** – WSP performed PRB OM&M for one year at the site. The PRB OM&M included four quarterly performance monitoring groundwater sampling events and PRB inspections. Six groundwater monitoring wells were sampled for analysis of chlorinated VOCs, hexavalent chromium, cyanide, and PFAS. The results of this investigation were utilized in completing the feasibility study.

**RMS and Waste Characterization** – WSP began work at the site by completing a historical records search and review to identify site use history and suspect regulated materials. During the Regulated Materials Survey (RMS), WSP identified 21 suspect asbestos containing materials (ACMs), collected 28 bulk asbestos samples, collected 10 non-asbestos samples, and incorporated historical sampling results. During the RMS, listed hazardous waste was identified based on documented spill information. Based on sample results, all the building material was identified as listed hazardous waste. The RMS results were incorporated into the bid specifications prepared by WSP.

**Demolition Bid Specifications**–WSP developed detailed specifications in Construction Specifications Institute (CSI) format for use by the City of Madison Heights (with EGLE Grant funds) to procure demolition and remediation services. The package specified asbestos abatement, hazardous building materials removal, building demolition, backfill and compaction, installation of a low-density polyethylene (LDPE) liner over the basement (source) area, Soil Erosion and Sedimentation Controls (SESCs), as well as debris and waste handling and disposal requirements in accordance with RCRA. The package included estimated quantities for each pay item, sampling analysis reports, and the asbestos survey results.

Waste Removal and Demolition Oversight – WSP provided full-time oversight during the asbestos and regulated materials abatement activities, building demolition, waste disposal activities, installation of a LDPE liner above the source area, and site restoration completed by the trade contractor. These activities were funded utilizing a Brownfield Redevelopment Grant. The asbestos and regulated materials abatement included removal of 58 cubic yards of asbestos waste and removal of universal wastes (fluorescent light ballasts and light tubes, mercury switch ampoules, and aerosol cans). The listed hazardous waste disposal included all building materials. The hazardous building demolition debris totaled 544 tons.

**Feasibility Study** – WSP completed a feasibility study to evaluate remediation alternatives for source area control and the protection of the groundwater/surface water interface (GSI) pathway. WSP evaluated Excavation and Disposal, In-situ Solidification, and In-situ Reduction and Adsorbent (ISCR), and Biologically Enhanced ISCR. WSP presented the results of the feasibility study to EGLE, and EGLE determined that ISCR will be the preferred remedy for source area control.

**Source Remediation Bid Specifications**—WSP developed detailed specifications in CSI format for use by EGLE to procure a remediation contractor. Currently, WSP is conducting a bench study to determine the effectiveness of Redox products to reduce site concentrations of contaminants of concern to below GSI criteria. The bench study was also funded utilizing a Brownfield Redevelopment Grant and the results will be incorporated in the bid specifications. The bid specifications will include soil excavation, In-situ soil treatment, hazardous and non-hazardous soil disposal (post In-situ treatment), backfill and compaction, SESCs, and site restoration. The package will include estimated quantities for each pay item, bench study report, and analytical analysis reports.

## Forbes Dry Cleaners Site

**Key Personnel:** Garret Bondy, Justin Gal, Nick Rogers, Michael McGowan, Deanna Hutsell, Lindsey Selvig, Megan Cynar, Doug Saigh, Nate Peck, Leonard Mankowski **Project Address:** 923 Ecorse Road, Ypsilanti Township, Michigan

Contact Name and Telephone: Ashley Lesser, EGLE Remediation and Redevelopment Division; (517) 285-6324

#### **Relevance to Work Requested in RFP:**

- Regulated Material Survey
- Use of Sewer Cameras
- Design and Specifications
- Bidding Document Preparation
- Contractor Procurement Assistance
- Environmental Investigation and Characterization
- Construction Oversight/Implementation
- Vapor Intrusion (VI) Investigation and Mitigation System Install

**Description**–Forbes Dry Cleaners operated from 1977 to 2016 as a commercial dry cleaner that utilized tetrachloroethene (PCE) in their cleaning process. Waste disposal prior to 2008 appeared to be properly manifested; from 2008-2016, it was unknown how/where the PCE waste was disposed. WSP was contracted to conduct a remedial investigation (RI); assist the State in procuring and managing the required construction services; and conduct a VI investigation.

**Design and Bid Package**–WSP prepared specifications for site remediation that included estimates of the building demolition, potential water to be dewatered during removal activities, soil removal, and developed a contingency in case unforeseen issues were encountered.

**Contractor Procurement**–WSP generated bidding documents and supported the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) in the contractor selection and procurement processes. WSP conducted the pre-bid meetings and developed the addendums to the specifications. WSP reviewed the bids, checked references, and issued a recommendation letter to EGLE for the lowest, responsive, responsible bidders.

**Environmental Investigation/Characterization**—To delineate utility corridors, the area immediately surrounding the dry-cleaning equipment, and property boundaries, WSP performed a RI. This investigation included soil borings and sampling, and groundwater monitoring well installation and sampling. Soil and groundwater sampling was done both on site and adjacent properties. Proper decontamination and disposal of investigation. WSP implemented a program for delineating utility corridors (including the use of sewer





**Project Highlights:** 

- Site was a former drycleaner that utilized PCE in cleaning process with unknown waste disposal from 2008 to 2016
- WSP prepared bid specifications and performed oversight for demolition and restoration activities
- Performed a remedial investigation to delineate PCE contamination
- Completed pre-demolition building survey prior to successful building demolition and site restoration
- Executed a vapor intrusion investigation to evaluate potential vapor intrusion risks throughout the site and surrounding area

cameras) near dry-cleaning equipment and property boundaries and further characterization of solvent impacts to soil and groundwater.

**Construction Management**–WSP completed a pre-demolition regulated material survey (RMS). The RMS included asbestos, lead-based paint sampling, and stained concrete sampling. In addition, the RMS identified, inventoried, and characterized regulated hazardous materials such as universal wastes, chemical stained surfaces, polychlorinated biphenyl containing equipment and materials, and

miscellaneous solid and liquid substances that would require waste characterization for management and disposal purposes.

WSP developed design specifications for building demolition that included estimates of the building demolition and developed a contingency in case unforeseen issues were encountered. WSP assisted EGLE with procurement of a remediation contractor and conducted oversight during the demolition. After the building was demolished, WSP conducted a waste characterization investigation of the soil and groundwater. WSP then developed separate design bid specifications for both onsite and offsite soil excavation and developed a "Contained Out" letter to limit both onsite and offsite Resource Conservation Recovery Act hazardous waste handling requirements. WSP assisted EGLE with contractor procurement and conducted oversight of the contractor during excavation activities. WSP conducted ambient air monitoring using an onsite portable gas chromatograph.

WSP successfully managed the building demolition and soil removal construction and site restoration activities. Our personnel conducted the pre-construction meetings, reviewed submittals, conducted progress meetings, issued bulletins, reviewed change orders, and monitored compliance with the specifications.

Vapor Intrusion Investigation—A site-wide soil gas survey was conducted to aid in the identification of volatile organic compounds. To evaluate the potential vapor intrusion risks throughout the site and adjacent properties, WSP installed soil vapor points on and around the site and collected indoor air samples. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in nearby residences based on soil vapor analytical results. Further soil vapor sampling is currently ongoing to better understand the potential human health risks.

### Former Chemical Plant Site

**Key Personnel:** Garret Bondy, Steve Murray, Leonard Mankowski, Justin Gal, Jeshua Hansen, Nate Peck **Project Address:** Danville, Illinois (Client Confidential) **Owner/Client:** Client Confidential

#### **Relevance to Work Requested in RFP:**

- Sewer System Evaluation
- VOCs in Groundwater
- · Soil and Hydrogeologic Investigations
- · Vapor Intrusion (VI) and Ambient Air Investigations
- Interaction with Property Owner/Access Coordination
- Evaluation of Sample Data
- Remedial Investigation/Feasibility Study (RI/FS) and Remediation System Design
- · Served as Prime Contractor for Remedial Construction

Description-This Site is a former chemical production and packaging facility located in east-central Illinois. The Site is over 80 acres in size with more than 20 acres comprising the plant's footprint. The Site is regulated under the Illinois Environmental Protection Agency (IEPA) Site Remediation Program (SRP) due to historical releases resulting in soil and groundwater impacted with volatile organic compounds (VOCs) and several inorganic constituents. A VI investigation identified the potential for an indoor inhalation hazard resulting in the installation of a sub-slab depressurization system beneath several buildings. During ongoing investigation activities, it was discovered via a sewer system evaluation that the integrity of the sanitary and storm sewers within the industrialized area of the Site had been jeopardized resulting in the transmission of contaminated groundwater to other locations on the Site. A RI/FS ultimately identified source area reduction via thermal remediation (Electrical Resistive Heating (ERH)) in concert with engineered phytoremediation (TreeWell® System) as the best alternatives to reduce contaminant concentrations in soil and groundwater. The TreeWell® system consists of 72 TreeWell® units to provide hydraulic control and treatment of the dissolved groundwater contaminant plume. The remedial action was approved by the IEPA and was implemented in 2018.



#### **Project Highlights:**

Conducted a sewer system investigation to determine the integrity of both sanitary and storm water pipe runs. Conducted a source area investigation using innovative technology to characterize and define source areas soils in a cost-effective manner. Combined multiple technologies (thermal remediation and engineered phytoremediation) to effectively remediate both source area soil and groundwater at the Site. Received an approved Remedial Action Plan from Illinois Environmental Protection Agency

Sewer System Evaluation–WSP personnel conducted an inspection of the sanitary and storm sewer lines to evaluate their condition. Inspections were performed on five manholes throughout the sanitary collection system with video inspection along portions of the sanitary line. Since infiltration of contaminated groundwater into the storm sewer was suspected, a video survey along portions of the storm sewer lines was also conducted. Due to the structural condition of the sewer, not all the storm lines could be evaluated.

**Source Area Investigation**—To determine the vertical and horizontal extent of source area soils, WSP completed several soils investigations. One of the investigations employed Tar-specific Green Optical Screening Tool (TarGOST®) (modified laser induced fluorescence), an efficient and cost-effective technology, to profile and characterize the distribution of contaminants in the subsurface. A subsequent remedial design characterization further defined the limits of the source area and provided valuable information for evaluating and defining the remedial action.

Interaction with Current Property Owner/Access Coordination—The Site was recently purchased by another party requiring WSP to work with both the liable party (former Site owner/client) and the new Site owner. The project team has fostered an excellent working relationship with the new Site owner,

regulator (IEPA) and client resulting in ease of accessing the Site for routine sample collection and scheduling/coordinating the planned remedial action.

WSP heavily relied on the principles of data management to successfully complete a thermal remediation project at an Illinois chemical production facility involving a historic release of 100,000+ gallons of carbon tetrachloride (CT).

Data from numerous site investigations including a subsurface investigation using TarGOST® technology to define and delineate the extent of contamination and a remedial design characterization with more than 250 samples collected from the source area were acquired, validated and stored for creating a Conceptual Site Model (CSM) and a subsequent 3-dimensional model using Environmental Visualization System (EVS) software. The models were used to identify potential migration pathways, exposure routes, and risk receptors, and to identify an effective remedial alternative that reduced the risk posed by CT (non-aqueous phase liquid). This information was used to help establish a target cleanup goal for the Site.

Based on the target cleanup goal and corresponding exposure routes the remedial alternative selected for addressing the source area was ERH and engineered barriers to eliminate specific exposure pathways. Additionally, engineered phytoremediation (TreeWell® system) was employed downgradient of the source area to induce hydraulic control and address downgradient groundwater. Soil and groundwater data collected from the TreeWell® system (installed prior to construction of the ERH system) and groundwater elevation data collected from transducers established to continuously monitor the hydraulic gradient (influenced by TreeWell®) were used to assist in the design of the ERH system.

### Former JB Sims Generating Station -Harbor Island

**Key Personnel:** Saamih Bashir, Leonard Mankowski, Justin Gal, Shalene Thomas, Dave Woodward, Sean Gormley **Project Address:** Harbor Island, Grand Haven, Michigan

Owner/Client Contract Contact Name and Telephone: Lara Zawaideh; HDR; (586) 753-3891

#### **Relevance to Work Requested in RFP:**

- Per= and polyfluoroalkyl substances (PFAS) Remedial Investigation (RI) sampling at a landfill
- Groundwater conceptual model update
- Groundwater fate and transport modeling
- Contractor Procurement Assistance
- Wetland Mitigation
- Construction Oversight/Implementation

**Overview** – WSP was contracted to work on the PFAS contamination at this Former JB Sims Generating station. The site was used for industrial purposes and waste disposal for over 100 years for city trash, dredge materials and coal ash from a coal power plant operation. PFAS contamination was initially inspected as part of the power plant contamination within the island. Previous investigations' soil boring logs show trash including but not limited to wood, leather, concrete cuttings, metal shavings, glass rubber and trace metals, which suggested the PFAS source is not the power plant operation.

**Data Mining**– WSP completed data mining to prepare for a project that has had limited investigations onsite. This involved reading prior reports, reviewing aerials of the site, completing desktop preliminary investigation (Phase I), and evaluating historical data.



#### Project Highlights:

- WSP will be investigating PFAS contamination at a Landfill
- VAP, installation of up to 10 GW monitoring wells
- WSP developed initial CSM
- Based on DGI results, WSP will update the CSM and develop groundwater fate and transport model
- Communication and coordination with EGLE Grand Rapids District and Water Resource Division

This allowed WSP to better understand the concerns onsite and be able to generate a work plan that is specific to the contaminants onsite, while also developing an initial conceptual site model (CSM).

**Data Gap Investigation** – WSP is completing a data gap investigation (DGI) to evaluate the PFAS concentrations across Harbor Island and to locate potential sources; evaluate the historical conditions to see if there is a link between the historical dumping operations and PFAS; and to assess if there is a correlation between surface water concentrations at the Grand River and the PFAS concentrations observed onsite.

The DGI involves installation of up to 40 vertical aquifer profiling (VAP) borings at two separate intervals where groundwater will be sampled at each location. Four direct push technology (DPT) borings will be advanced upgradient of the site where groundwater will also be collected. Soil samples will be collected at approximately every other boring. Ten permanent monitoring wells will be installed at locations with the 10 highest PFAS concentrations once all sampling has been completed. Surface water sampling will be completed at six separate locations surrounding the island to evaluate upgradient, side gradient and downgrade concentrations.

Quarterly groundwater sampling and gauging will take place at all new monitoring wells and at ten existing wells. Quarterly sampling will also include collection of up to six surface water samples from stilling wells and additional surface water locations located on site.

**Groundwater conceptual model update/ fate and transport modeling** – WSP collected soil samples to be analyzed for other constituents that will support evaluation of PFAS fate and transport (e.g., total organic carbon, pH, moisture content, and grain size). Results from the DGI will be used to update the

CSM and create a groundwater flow model to understand the fate and transport of PFAS within the site. VAP boring logs will also be used to develop and update the CSM.

**Remedial Investigation and Remedial Design**—Based on the updated CSM and the groundwater model fate and transport results, RI activities will be executed to fully define the lateral and horizontal PFAS contamination as well as the other landfill constituents. An alternatives analysis and feasibility study will be prepared and discussed with the client. The goal will be to select one remedial alternative to remediate PFAS, other landfill constituents and coal ash so that the site can be restored for the decided future use. Wetland mitigation will be considered during the remediation.

## Fort Gratiot Landfill

Key Personnel: Jason Armstrong, Garret Bondy, Michael McGowan, Jeshua Hansen Project Address: 3290 Keewahdin Road, Fort Gratiot (Port Huron), Michigan Owner/Client Contract Contact Name and Telephone: Allyson Hartz; EGLE; (586) 256-0347

#### **Relevance to Work Requested in RFP:**

- Leachate Control
- Methane Gas Control
- UST Removal
- Landfill Design and Specifications
- Bidding Document Preparation
- Contractor Procurement Assistance
- Construction Oversight/Implementation
- System Operation/Maintenance

**Remediation System Design**–WSP designed a dual composite liner final cover system for the landfill which also included a leachate collection system with treatment and discharge to the Port Huron Wastewater Treatment Plant, a methane gas venting system with perimeter gas monitoring points, groundwater/leachate interceptor system, and storm water collection and detention facilities. WSP's design included preparation of specifications in Construction Specifications Institute (CSI) format and MICHSPEC<sup>TM</sup>.

**Procurement**–WSP provided procurement assistance including preparation of the advertisement, pre-bid meeting, issuance of addendum, pre-award meeting with the apparent low bidder, review of low bidder's references, completion of a bid tabulation comparing bids and to identify bid discrepancies, preparation of the contract form, and recommendation.



#### Project Highlights:

- WSP designed the landfill cap, methane and leachate collection systems for <u>closure</u>.
- WSP provided construction oversight on behalf of EGLE
- WSP is managing the maintenance of the cover system, the groundwater extraction system, the leachate collection system, and the methane gas venting system.
- Modified adjacent ponds to include island for bird habitats

**Construction Oversight**–WSP completed observation and documentation of the system installation, and assistance during the first year of operation of the system by the trade contractor. WSP reviewed the contractor's technical and equipment submittals for conformance with the specifications and provided a full-time project representative to observe that the work was performed in accordance with the drawings, specifications. Progress meetings were held to discuss the construction schedule and work completed, and WSP prepared bulletins for changes in scope items. WSP prepared a Quality Control Assurance Plan detailing the test procedures and acceptance criteria for the installation of the flexible membrane liner and soil cover system.

The construction included installation of a cover system using a flexible membrane liner followed by a geocomposite drainage layer, two feet of low permeability clay, top soil, and seed; installation of a leachate control system consisting of a leachate/ groundwater collection trench and a 6-inch diameter sewer allowing gravity discharge to the city sewer; and installation of a landfill gas venting system consisting of a sand gas vent layer, horizontal gas collection piping, three gas collection trenches, and 24 passive gas vents.

**Pond Restoration**—During landfill cover construction activities, areas of the pond were filled and graded to create islands for the installation of bird habitats. The pond slowly grew over time and started encroaching onto the adjacent property. In 2015 WSP provided contractor oversight and documented activities conducted to prevent the inundation of the adjacent property by the landfill's excess water. These pond and wetland restoration activities included culvert replacement, ditch construction, and weir construction to restore the pond and mitigate flooding of the surrounding adjacent properties.

**Landfill Operation and Maintenance (O&M)**—WSP is currently providing assistance during the O&M period by reviewing contractor reports and assisting in technical issues arising from the operation of the

landfill cover, leachate recovery system, gas monitoring, and stormwater systems. WSP was able to reduce the amount of monitoring and reporting required by the City of Port Huron for discharge of treated leachate to the City's Publicly Owned Treatment Works (POTW) and eventually eliminated the need for a National Pollutant Discharge Elimination System (NPDES) permit associated with the discharge. WSP has also recently assisted in the modernization and upgrading of the pumps, sensors, and controls associated with the groundwater collection and leachate control systems currently in operation at the site.

**SESC**–WSP prepared a Soil Erosion and Sedimentation Control (SESC) Plan detailing the measures (e.g., silt fence, storm sewer inlet protection) to prevent soil from entering the public storm sewer system. Michigan Department of Technology, Management, and Budget (DTMB) conducted weekly inspection during construction.

Well Abandonment–WSP completed observation and documentation of abandonment of a 112-feet deep monitoring well and 10-inch steel protective casing located on a small peninsula in the large surface water body immediately north of the landfill. Access to this portion of the site was limited due to the presence of the surface water and the erosion of the sand peninsula. The monitoring well and 10-inch steel casing was tremie grouted and documentation of the well abandonment activities was provided to State of Michigan Department of Environment, Great Lakes, and Energy (EGLE).

**UST Removal**—Upon discovery of an abandoned 10,000-gallon underground storage tank (UST) at the site using Ground Penetrating Radar (GPR) technology, WSP provided oversight for the pumping out and removal of the UST. Following liquid removal and disposal, the UST cavity was then backfilled with clean fill and the UST was transported off-site for recycling.

Landfill Monitoring—For nearly 15 years, WSP has performed landfill monitoring consisting of collecting landfill gas measurements, groundwater samples, and surface water samples for analyses of a wide range of parameters including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, chloride, and per- and polyfluoroalkyl substances (PFAS). WSP has assisted in optimizing both the monitoring frequency and required analytical parameters at the site. Landfill gas monitoring probes at the site are routinely monitored for the presence of methane (CH<sub>4</sub>), carbon monoxide (CO), oxygen (O<sub>2</sub>), and the percent lower explosive limit (LEL) to assess potential migration of landfill gases toward the adjacent properties. Groundwater monitoring is conducted to evaluate the landfill's impact on the underlying groundwater and to ensure that impacted groundwater is not migrating off-site toward sensitive environmental receptors in the area. Groundwater elevations at the site are monitored to evaluate the effectiveness of groundwater collection trenches designed to capture impacted groundwater and landfill leachate migrating away from the landfill. The operation and maintenance of the groundwater is effectively being captured and that the landfill leachate is properly conveyed to the POTW for treatment.

**Per- & Polyfluoroalkyl Substances Sampling**—Recent monitoring activities at the site has included groundwater, leachate, and surface water sampling for PFAS. WSP has remained current with the everchanging rules, regulations, and sampling guidance for PFAS monitoring and has conducted groundwater, leachate, and surface water sampling in accordance with recently published EGLE sampling guidance documents. The extent of PFAS impacts associated with the site and potential transport mechanisms are currently being evaluated. WSP has also performed a limited feasibility study to assess potential feasible treatment options associated with the PFAS impacts in the landfill leachate and groundwater.
# **Gudith Road Landfill**

**Key Personnel:** Garret Bondy; Mike McGowan; Lindsay Selvig; Megan Cynar; Doug Saigh; Nick Rogers; Anita Emery-DeVisser; Nate Peck

**Project Address, City, State, Zip:** Southwest Corner of the Intersection of King Road and Gudith Road in Woodhaven, MI

Contact Name and Telephone: Beth Vens, EGLE Remediation and Redevelopment Division; (586) 484-1030

#### **Relevance to Work Requested in RFP:**

- Support for Brownfield Redevelopment
- Remedial Investigation and Feasibility Study
- Vapor Intrusion to Indoor Air Assessment
- Evaluation of Current Indoor Air Mitigation Systems
- Sewer Video Inspection and Jetting
- Remedial Design to Protect Surface Waters
- Construction Oversight

**Description**— The Gudith Road Landfill Site (Site, aka Timber Ridge Subdivision) is located on the southwest corner of the intersection of King Road and Gudith Road in Woodhaven, Michigan. A condominium complex consisting of 10 buildings and 32 individual condominium units was constructed over this unlicensed landfill in 2000. Buildings on the southeast corner of the property have been sporadically experiencing issues with basement sumps that include odors emanating from the sumps and oily discharges into the sumps. Building sumps and other surface storm water discharge to an onsite retention pond that drains to the Woodhaven storm system that ultimately discharges to the Brownstown Creek, located approximately 2,000 feet west of the Site.

Goals of the project are to: define the extent and distribution of the dissolved groundwater contamination and soil contamination; assess how this contamination may affect vapor intrusion in buildings, the on-site storm water management system, and the discharge to Brownstown Creek; and identify mitigation options for the risks to the Brownstown Creek.



#### **Project Highlights:**

- Assessment of indoor air and
- evaluation of mitigation systems
- Jetting and camera work on storm sewer lines connected to the retention basin

**Geophysical Survey**–WSP conducted an integrated frequency-domain electromagnetic (EM) and ground-penetrating radar (GPR) geophysical investigation to delineate landfill waste or unregulated fill material extents. Results indicated disturbed areas that likely represent fill and landfill waste. Soil and groundwater sampling locations were selected using survey results.

**Soil and Groundwater Investigation**–WSP conducted a remedial investigation of soil and groundwater that included the completion of 48 soil borings, the collection of 100 soil samples, and the installation of 20 monitoring wells (two nested pairs) and groundwater sampling. Soil sampling results indicated that select chlorinated volatile organics, semi-volatile organics, and metals are present in concentrations greater than site-specific volatilization to indoor air criteria.

Groundwater monitoring confirmed the southeast gradient, and sampling results indicated that detectable contaminants are present in concentrations below residential criteria, with only two exceptions (trichloroethene and arsenic) at two downgradient locations. Residents are supplied with municipal drinking water.

**Vapor Intrusion to Indoor Air Assessment**–WSP completed an investigation to evaluate the potential inhalation exposure to volatile organic compounds (VOCs) via the volatilization to indoor air pathway

(VIAP). WSP oversaw the installation of soil vapor pins and soil vapor points. WSP conducted soil vapor and indoor air sampling for VOCs and completed quarterly mitigation system monitoring (i.e., pressure checks, cracks/seal monitoring). Results indicate that homeowners are not exposed to vapor intrusion at concentrations greater than residential criteria.

**Stormwater, Utility, and Basin Inspection/Evaluation** -WSP evaluated the downgradient portion of the existing stormwater system to assess: (1) whether groundwater was infiltrating the system; (2) the reason for stormwater backups in two catch basins; (3) the frequency of discharge to the municipal stormwater system; and (4) the concentrations of contaminants discharging to the municipal system. WSP sampled the stormwater in the site catch basins and at the outfalls in the downgradient retention pond, which discharges to the municipal stormwater system. WSP installed a pressure transducer and datalogger in the pond's standpipe and confirmed that the pond discharges stormwater to the municipal system when the water table is high or after significant precipitation events. WSP corresponded with the condominium homeowners' association and the City of Woodhaven Engineering department to obtain as-built drawings of the on-site utilities and completed an investigation of the onsite stormwater sewer system in a portion of the site through video inspection/water-jetting to clear obstructions, identify cracked, broken, or separated pipes, or pipes improperly mortared to the catch basin.

The retention pond and catch basins had filled with sediment over 20 years since completion, which reduced capacity. To clear obstructed outfalls and return the retention pond to designed capacity, WSP assisted the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) with hiring a contractor to remove sediment in the catch basins, pipelines, and retention pond to restore original design and elevations. After jetting, video of piping between the overflowing catch basins and the retention pond did not show any breaches or obstructions. Groundwater does not appear to be infiltrating the pipelines and catch basin overflows were likely due to sediment buildup that reduced capacity and blocked system outfalls. WSP collected samples of the stormwater discharging to the retention pond and discharging to the municipal systems. No contamination greater than groundwater to surface water (GSI) criteria was detected.

**Construction Oversight**–WSP ensured the installation of soil erosion and sedimentation controls (SESC) and oversaw the dewatering, dredging, transporting, and disposal of non-hazardous impacted soils/water within the retention basin to return it to the original design elevation. WSP oversaw the excavation and disposal of impacted soils around two catch basins, excavation backfilling, and site restoration of both upland cover and wetland plantings.

### Harbor Plating - Groundwater Treatment System

Key Personnel: Garret Bondy, Michael McGowan, Jeshua Hansen Project Address: Benton Harbor, Michigan Owner/Client Contract Contact Name and Telephone: Pablo Mora, EGLE, (269) 567-3524

#### **Relevance to Work Requested in RFP:**

- Protection of Wetlands and Stream
- Focused Investigation and Feasibility Study
- Remediation System Design and Specifications
- Construction Oversight/Implementation
- Remedial System Operation & Maintenance
- PFAS Investigation

**Description**–The Site is an abandoned chrome and cadmium plating facility located in a mixed light industrial and residential neighborhood. Chromium and volatile organic compounds (VOCs) have contaminated soil and groundwater on and off the facility. Ox Creek borders the property to the west and flows north to the Paw Paw River, which then flows a short distance to the St. Joseph River and Lake Michigan. The chromium contamination was determined to be both a Resource Conservation Recovery Act (RCRA) Listed and Characteristically hazardous waste by the United States Environmental Protection Agency (USEPA) and State of Michigan Department of Environment, Great Lakes, and Energy (EGLE). WSP was tasked with designing and installing a groundwater collection and treatment system to prevent further migration of contaminated groundwater to the adjacent creek.

**Feasibility Study**–WSP completed several investigations as part of the Feasibility Study (FS) including several bail-down groundwater pump tests to determine groundwater recharge and optimal removal rates. The FS included technologies such as in-situ permeable reactive barriers and groundwater pump and treatment using ion exchange. The best remedial alternative for the groundwater cleanup and protection of the adjacent creek was a groundwater treatment system.



#### **Project Highlights**:

- Perform a focused Remedial Investigation and Feasibility Study to support the selection and design of the remedial response.
- Designed and prepared specifications for installation of groundwater collection and treatment system
- Conducted oversight of treatment system installation and operation and maintenance.
- Reduced groundwater concentrations of metals and VOCs venting to wetland and surface water
- Conducted a PFAS
- groundwater investigation

Remedial Design—For the groundwater cleanup, an iron co-precipitation process was designed to remove the chromium with a granulated activated carbon polish. The iron co-precipitation is a patented method of activating iron to indiscriminately remove all heavy metals from water. The design included an 800-foot long groundwater collection trench with pneumatic pumps. The treatment system was designed for a maximum flow rate of 30 gallons per minute with a 99% chromium removal rate. The treated water was discharged to the local wastewater treatment plant (WWTP) by permit. A SCADA system was installed to allow the operator to remotely monitor the treatment system and turn on and off various components. WSP also conducted property boundary surveys, developed easement documents for the piping through adjacent properties, and assisted EGLE with obtaining access agreements with adjacent property owners. WSP's design included preparation of specifications in Construction Specifications Institute format and MICHSPEC<sup>TM</sup>.

**Construction Oversight**–WSP observed and documented the installation of the treatment system. Construction activities included surveying, installation of collection trenches and concrete structures by soil excavation, installation of transport pipes and air lines (for the pumps) by directional drilling, building repairs and upgrades, installation of treatment system equipment, and site restoration. WSP verified the work was completed per the specifications, assisted EGLE with contractor payment requests and change orders, and completed a final report detailing construction activities.

**Operation and Maintenance**–WSP is currently observing, and documenting operation and maintenance activities being conducted by a contractor. WSP monitors the system, verifies the treated water is in compliance with the WWTP permit requirements, troubleshooting, and reviewing contractor submittals and payment requests.

**Protection of Wetlands and Stream**—The current treatment system protects Ox Creek and the surrounding wetlands by intercepting impacted groundwater and reducing VOC and metals concentrations in groundwater. Since system startup, contaminant concentrations have shown an overall decreasing trend.

**PFAS Investigation**–WSP conducted a PFAS groundwater investigation to characterize the site's groundwater. The data will be used in a future Focused Feasibility Study that evaluate potential remedial technologies to reduce risk at the site and eventually cease operations of the groundwater collection and treatment system.

### **Hensley Property**

Key Personnel: Garret Bondy, Michael McGowan, Megan Cynar, Justin Gal, Nate Peck Project Address, City, State, Zip: 840 North Old US Highway 27, Marshall Michigan 49068 Contact Name and Telephone: Zachary McFaul, 269-270-2259

#### **Relevance to Work Requested in RFP:**

- Free Product Investigation and Remediation
- . **Brownfield Redevelopment**
- **Environmental Investigation**
- Feasibility Study
- Laser-Induced fluoroscopy investigation
- **Remedial Design and Construction Oversight**
- Vapor Intrusion Investigation

**Description**— The Hensley Property site is a former Boron Oil gas station with a leaking underground storage tank (LUST). The Site is currently vacant property. A confirmed release from the underground storage tank (UST) system was reported and corrective actions were completed between approximately 1992 and 1997. Historic corrective actions for the LUST site included the installation of monitoring wells, soil and groundwater sampling, and the submission of reports. A closure report was submitted in 1997.

A Baseline Environmental Assessment (BEA) was submitted to the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) in 2017, that reported concentrations of petroleum related compounds in saturated soil and groundwater above Part 213 risk-based screening levels (RBSLs). The soil samples collected and analyzed as part of the BEA process were saturated with groundwater and not comparable to unsaturated soil sample or groundwater sample analytical results. A review of the 1997 closure report revealed that: 1) concentrations reported in the 2017 BEA exceed Site-Specific Target Levels (SSTLs) developed in the closure report; 2) some concentrations of contaminants reported in the 1997 closure report exceeded SSTLs that were developed in the closure report; 3) SSTLs developed in the closure report were not based on residential land use assumptions and no institutional controls were recorded on the property that would limit land use. Therefore, in 2017 EGLE reopened the confirmed release.



Project Highlights:

- Soil, Groundwater, and Vapor Intrusion Investigation
- Conducted a LIF investigation to delineate free product
- Developed Feasibility Study to
- compare remedial option Prepare bid specifications Provide full-time oversight of the trade contractor's work and adherence to the bid specifications

WSP was contracted complete a site investigation, prepare bid specifications, assist with Trade Contractor procurement, and oversee site remediation. WSP conducted a soil and groundwater investigation including Laser-Induced Fluorescence (LIF), developed a Feasibility Study to recommend remedial options, conducted a Bench and Pilot Studies using BOS 200® (an In-situ remedial technology), developed bid specifications including the use of BOS 200 ®, assisted with contractor procurement, and provided construction oversight for the remedial action.

Soil, Groundwater, Vapor Intrusion Investigation - WSP completed a soil, groundwater, and soil gas investigation to delineate the contamination onsite. The investigation included LIF to determine the extent of the free product. The results of this investigation were utilized in completing the feasibility study.

Feasibility Study - WSP completed a feasibility study to evaluate remediation alternatives to remediate the free product on the property. WSP evaluated a Sub-Slab Depressurization System with Deed Restriction on Future Buildings, In-situ Carbon Adsorbent with Enhanced Biodegradation (BOS 200®),

and Air Sparging/ Soil Vapor Extraction with Enhanced Biodegradation. WSP presented the results of the feasibility study to EGLE, and EGLE determined that BOS 200 ® was the preferred remedy.

Ground Penetrating Radar - WSP completed an underground utility survey. The utility locations were located using ground penetrating radar (GPR), staked and the type (water, sewer, etc.) were recorded.

**Bench Study** - WSP completed a Bench Study using the BOS 200®. WSP collected and submitted a 500 milli-liter sample of LNAPL to the BOS 200® vendor to evaluate the dosing required. Data from the Bench Study was used to determine the optimal injection loading of the BOS 200® for use in a pilot study.

**Pilot Study** - WSP completed a Pilot Study using BOS 200<sup>®</sup>. The Pilot Study consisted of 14 injection points to a depth of 15 feet below ground surface and installation of three monitoring wells. The results of the Study were used to determine the optimal injection pressure, radius of influence, and product quantities.

**Bid Specifications**–WSP developed detailed specifications in Construction Specifications Institute format for use by EGLE to procure a remediation contractor. The package included estimated quantities for each pay item, sampling analysis reports, and the results of the Pilot Study. WSP also presented to the EGLE In-situ committee and obtained approval for the BOS 200® remedy. WSP assisted EGLE with Trade Contractor procurement including issuing addenda, review the bids, and recommending a contractor.

**Remediation Oversight** - WSP provided full-time oversight during the In-Situ remedy. Approximately 28,000 pounds of BOS200® was injected into 139 injection points during the implementation of the remedy. WSP is currently completing the construction report documenting remedial activities.

### Kalamazoo River Superfund Site - Otsego Township Dam Time Critical Removal Action

**Key Personnel**: Garret Bondy, Nick Rogers, Jeshua Hansen, Anita Emery-DeVisser, Dave Woodward **Project Address, City, State, Zip:** Otsego Township, Michigan **Contact Name and Telephone**: Confidential Client, Scott Keesling, 404-652-8555

#### **Relevance to Work Requested in RFP:**

- Time Critical Removal Action Under Oversight by USEPA Region 5 and EGLE
- Prepared Planning Documents
- Pre-Design Sampling to Support Remedial Design
- · Remedial Design and Remedial Action
- Construction Oversight
- · Community Relations/Multiple Stakeholders

**Description**—The Kalamazoo River is a "Great Lakes Area of Concern" with nearly 100 years of historic industrialized use. Discharges from numerous industrial facilities have resulted in polychlorinated biphenyls (PCBs) in sediments, floodplain soils and fish. The Kalamazoo River Superfund Site consists of 80 miles of river, hundreds of miles of adjoining shoreline, 1,600 acres of lake and thousands of acres of outlying floodplains.

**Pre-Design Work Plans, Permitting, and Surveys**–WSP completed pre-design work plans which considered wetland identification, cultural and natural resources identification, threatened and endangered species mitigation, topographic and bathymetric surveying, pre- and post-dam removal hydrodynamic modeling, and sediment and bank soil characterization. WSP worked with the United States Environmental Protection Agency (USEPA) and other government stakeholders including the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) Superfund Division and Hydrologic Studies and Dam Safety Unit, Michigan Department of Natural Resources (MDNR), United States Fish and Wildlife Service (USFWS), and others to negotiate and permit related items and plan for removal of a temporary water control structure.

Sediment and Bank Soil Sampling and Characterization–WSP evaluated and summarized previous sediment and bank soil sampling results and completed targeted pre-design sampling to fill data needs in existing PCB data. Historical and pre-design PCB data were then reviewed and evaluated using data interpolation and modeling tools developed by WSP. Using these tools allowed





Project Highlights:

- Dam removal, sediment dredging and riverbank restoration, restored 1.7 miles of the Kalamazoo River
- Completed work under accelerated time critical schedule.
- Collected over 650 pre-design samples in the support of remedial design evaluation, planning, and selection.

USEPA Region 5 Administrator, Cathy Stepp: "I don't know if there's a better example, frankly, of the success of the Superfund cleanup in the country than right here in Michigan along the Kalamazoo (River)."

WSP to better define and communicate limited areas of impacted material to be remediated and areas of material which could be reused at the Site.

**Design Plans, Specifications, and Contractor Procurement–**WSP developed detailed plans and specifications for the remedial and restoration designs. Design plan packages were prepared for each Bank Removal and Stabilization Area (BRSA) and included information on construction procedures and sequencing, soil erosion and sediment control measures, water control and treatment, material reuse and disposal management, contingency planning, pre- and post-dam removal hydrodynamic and

sediment transport modeling using HEC-RAS and DELFT-3D, remedial excavation and dredging plans, and stream and riverbank stabilization and restoration plans. Due to the accelerated schedule of the time critical project, the design process included draft and final design deliverables, as well as ready-for-construction drawings and specifications. Using the design and specification information, WSP then prepared bid package documents and supported its clients with solicitation and procurement of remedial and restoration contractors. Procurement support also included response to contractor requests for information, issuance of design change bulletins and review of change orders, and review and negotiation of contractor pricing and contracts. In addition to procurement support associated with vendors contracted directly with its clients, WSP managed procurement, administration, and contracting of its own subcontractors who ranged from land surveyors to freshwater mussel relocation divers.

Sediment Management and Dam Removal–WSP's design also aimed at the goal of removing a temporary dam and meeting MDNR's goal of restoring river connectivity in the area. Design engineering plans for removal of the temporary dam included lowering the impoundment and managing accumulated sediment. While impacted sediment was removed from the Site and disposed, an approximate 2,000-foot-long pilot channel was dredged along the historical thalweg of the river upstream of the temporary dam. The pilot channel allowed for preferential placement of the designed river thalweg, lowering of the impoundment via the temporary dam water control structure, and mobilization of clean sediment either downstream or for beneficial reuse on-site. Clean sediment removed via the pilot channel dredge was hydraulically pumped to a former spillway hole, without dewatering, which allowed for cost-effective stabilization and restoration of that portion of the Site. Lowering of the impoundment through the pilot channel also facilitated additional, more cost-effective work in the dry along former riverbanks.

**Construction Management–**WSP successfully managed the scope, schedule, and budget of the construction project which spanned three construction seasons, including winter work. The project included remediation, stabilization, and restoration of approximately 1.7 miles of river, the majority of which was remediated and restored with coir face wrapped earth, rip rap imbedded with live plantings, root wads, J-hook vanes, and woody debris. WSP's construction management team was responsible for oversight of construction activities; communication with its clients, contractors, USEPA, and other stakeholders; preparation of construction documentation including daily/weekly reports, schedules, and tracking logs, and for the overall collection and management of site data, vendors, and materials. WSP set up and managed a project SharePoint site to submit and maintain project information and deliverables.

**River Stabilization and Stream Restoration**–WSP's remedial and restoration design provided for the removal of PCB-impacted sediment and riverbank soil followed by measures to stabilize and restore the stream using select elements of natural channel design. The goal of stabilization and restoration was to provide for a clean buffer corridor in which the channel could reside but would resist erosion into floodplains and limit long-term monitoring and maintenance. WSP's approach considered historical river channel dimensions and features (such as bank full flow and dimensions, meander patterns, subgrade slope, and substrate particle size) along with select elements of natural channel design and bioengineering techniques to achieve this goal, while also providing ancillary benefits of improved channel and floodplain connectivity, ecosystem function, and wildlife habitat.

Restoration techniques were employed both on riverbanks and in-stream structures. J-hook vanes over 90 feet in length were installed in areas with river flow velocities which exceeded 7 feet per second and are now directing flow back to the center of the channel, working in concert with riverbank treatments. Root wads, footer logs, and woody debris obtained through a mutually beneficial arrangement with MDNR anchor more robust bank treatments, which are then planted with native, local seed, live stakes, and plants. Plantings have been designed to grow into grasses, sedges, shrubs, and trees that will fill in the various riparian layers along the riverbanks. The goal being that, by the time the wood bank treatments rot away, mature climax forest has taken over riverbank stabilization.

**Community Relations**—At key milestones throughout the construction process, WSP's project team facilitated project updates and tours with USEPA, EGLE, MDNR, USFWS, NOAA, state and local government officials, universities, media, and public representatives. WSP also supported USEPA during various public meetings.

# Lower Rouge River – Old Channel RI/FS

Key Personnel: Garret Bondy, Michael McGowan, Justin Gal, Doug Saigh, Nick Rogers, Jeshua Hansen Project Address: 1200 Zug Island Road, Detroit, MI

Owner/Client Contract Contact Name and Telephone: Jessica Telano, Confidential Client 973-455-2009

#### **Relevance to Work Requested in RFP:**

- Developed Partnership Plan for USEPA and WSP Client
- Review and Oversight of USEPA Activities
- Sediment Geotechnical Sampling
- Streambank Sampling using LIF Technologies
- Feasibility Study
- Remedial Design and Construction Oversight
- Streambank Habitat Assessment

**Description.** The Lower Rouge River – Old Channel (LRROC) is located within the Rouge River "Great Lakes Area of Concern" in a highly industrialized area of Detroit with nearly 100 years of historic industrialized use, including steel mills, paper mills, and former coal tar plants and coking facilities. Studies of the river sediments completed by the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) and by the United States Environmental Protection Agency's (USEPA) Great Lakes National Program Office (GLNPO) indicated that elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) are present in quantities that exceed Sediment Quality Guidelines.



#### **Project Highlights**

- Innovative Sediment
- Sampling protocol
- · LIF NAPL screening
- Stream Bank and Habitat Quality Assessment
- Geotechnical Investigation
- Evaluation of sediment
- dredging and capping

Plan Development. WSP, working on behalf of the Non-Federal

Sponsor worked closely with GLNPO to develop the scope of work for the remedial investigation/feasibility study/remedial design (RI/FS/RD), including authoring the proposal for Great Lakes Legacy Act funding for the RI/FS. WSP calculated Equilibrium Partitioning Sediment Toxicity Unit (ESBTUs) benchmarks for PAHs in sediment using data previously collected by GLNPO/EGLE to further refine the data gap analysis and proposed sediment sampling locations

**Review and Oversight of USEPA Activities**. WSP reviewed plans that were drafted by GLNPO and then prepared a thorough field investigation, sampling plan, and quality assurance project plan. WSP emphasized the need to focus on sediment sampling and analysis measures that most directly targeted those sediments expected to express PAH bioavailability and benthic toxicity. WSP also provided field oversight of hydrographic/side-scan sonar surveys, sub-bottom profiling, and sediment thickness measurements. Following data evaluation of the hydrographic and sediment thickness surveys, WSP assisted GLNPO in identifying sampling locations for sediment/pore water sampling and provided field oversight of GLNPO's sediment sampling.

Remedial Investigation. WSP conducted a geotechnical study, a screening-level analysis of potential non-aqueous phase liquid (NAPL) source areas, a shoreline and an aquatic vegetation /habitat survey, and prepared major sections of the RI report. As part of a source evaluation, WSP completed near-shore sediment/stream bank sampling in areas with the potential for contaminant migration from upland sources to the channel. Near-shore sampling was conducted from a boat equipped with a hydraulic push probe using Ultra-Violet Optical Screening Tool (UVOST®) technology, a type of laser-induced fluorescence (LIF) that screens for NAPLs containing PAHs. UVOST® results were compared with historic data collected by WSP using Tar Green Optical Screening Tool® (TarGOST®), another type of LIF to evaluate potential upland NAPL sources to river. WSP provided expert review and guidance for preliminary contaminant delineation, sediment transport evaluations, and interpretations on the environmental dataset. WSP also completed a habitat quality assessment to evaluate where habitat could be created or enhanced, and a shoreline conditions survey.

Feasibility Study (FS). WSP led the development of the FS. Key to the FS was a 3D contaminant

delineation model, based on a multiple lines of evidence approach and those factors most heavily affecting benthic toxicity. WSP has encouraged a combined dredging and capping remedy that best addresses practical constraints of the project and upland sites, future navigational uses, and the requirements for stable banks and sediment beds. As a highly developed river with steep, erodible banks, care was taken to provide accurate cost estimates and to assess hazards of bank failures, damage to utilities, and other factors that will be needed to be more fully assessed in the remedial design.

**Remedial Design (RD).** The RD included pre-design investigation activities to collect additional data necessary to refine the remedial footprint and to support preparation of plans and technical specifications for the remediation of the LRROC sediment that includes dredging approximately 70,000 cubic yards of contaminated sediments and capping 0.75 acre along with habitat enhancement.

WSP RD activities focused on the design of permanent shoreline stabilization measures associated with channel side slopes and the dredge prisms geometry, including completion of upland geotechnical investigations. The 2540-foot long and 80- to 90-foot-deep permanent sheet pile wall was designed to enable implementation of the dredging remedy and to provide adequate long-term embankment stability. Artesian groundwater flow from the underlying bedrock to the upper aquifer were noted during completion of deep geotechnical borings. Additional geotechnical investigation and stability evaluation was completed to ensure that the permanent sheet pile wall will not be driven into the bedrock and potentially create artesian flow. A contingency plan was developed to address potential concerns for artesian flow and long-term stability based on the detailed data provided during construction.

**Remedial Action Construction Oversight** - WSP procured the construction contractor and provided full-time construction management. Wall system construction/installation began in July 2018 and completed in accordance with design documents in December 2019. Installation of the sheet pile wall involved utility location using ground penetrating radar technology, utility relocation or removal of abandoned utilities. An asbestos lined abandoned pipe was encountered during installation of the wall tiebacks. Proper National Emission Standards for Hazardous Air Pollutants notification was provided prior to removal of the pipe. Free product accumulating in the excavation was contained on site using frac tanks prior to waste characterization and proper disposal. Survey of the wall system was completed during construction to document and track movement throughout construction and establish baseline conditions for stability monitoring during dredging that is anticipated to start in 2023.

# Marshall Iron and Metal

**Key Personnel:** Garret Bondy, Michael McGowan, Megan Cynar, Justin Gal, Nate Peck **Project Address, City, State, Zip:** 801 Industrial Road, Marshall Michigan 49068 **Contact Name and Telephone:** Gregg Brettmann, 269-567-3528

#### **Relevance to Work Requested in RFP:**

- Free Product Investigation and Remediation
- Environmental Investigation
- Utility Inspection
- Feasibility Study
- Laser-Induced fluoroscopy (LIF) investigation
- Remedial Design and Construction Oversight
- Vapor Intrusion Investigation

**Description**— The Marshall Iron and Metal site is 4.11 acres in size located in a mixed industrial, commercial, and residential area within the City of Marshall, Michigan. The site was part of a railroad maintenance yard, including a coal house and lumber yard, from 1899 to 1931. From 1938 to 1960, a foundry operated adjacent to the site. The site operated as an auto salvage and scrap yard from approximately 1961 to 1996, after which the owner discontinued operations and removed all of the remaining scrap metal.

On December 21, 2004, WSP and the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) discovered approximately 6 inches of free-phase petroleum hydrocarbon product (free product) in one of the monitoring wells located south of Industrial Road and west of Kalamazoo Avenue. The free product was discovered during routine field measurements of static water levels in monitoring wells used to identify regional groundwater flow direction for a nearby EGLE site.

WSP was contracted to complete a site investigation, prepare bid specifications, assist with Trade Contractor procurement, and oversee soil excavation remediation. During soil excavation activities, free product was discovered to have migrated to the adjacent wastewater treatment plant (WWTP) property. WSP conducted an offsite soil and groundwater investigation utilizing Laser-Induced Fluorescence (LIF) technology, developed a Feasibility Study to recommend remedial options, conducted a Pilot Study using BOS 200® In-situ remedial technology, developed bid specifications using BOS 200 ®, assisted with contractor procurement, and oversaw the remedial action.



#### Project Highlights:

- Free Product Investigation and Remediation
- Conducted a LIF investigation to delineate free product
- Developed Feasibility Study to compare remedial option
- Prepare bid specifications
  Provide full-time oversight of the trade contractor's work and adherence to the bid specifications

**Source Remediation Bid Specifications**—WSP developed detailed specifications in Construction Specifications Institute (CSI) format for use by EGLE to procure a remediation contractor. As part of the bid specifications, WSP developed the Bid Schedule which included estimated quantities of impacted soil to be removed, free product removal, and backfill material. WSP assisted EGLE with Trade Contractor procurement including issuing Addenda, review the bids, and recommending a contractor.

**Source Remediation Oversight** - WSP provided full-time oversight during the soil excavation activities. Approximately 10,000 tons of impacted soil was removed and disposed in a Type II landfill. The excavation was backfilled with approximately 9,400 tons of clean Michigan Department of Transportation (MDOT) Class II sand. After the activities were completed, WSP developed the construction report detailed the remedial activities. **Soil and Groundwater Characterization/Investigation** – WSP completed a soil and groundwater investigation to delineate the free product both onsite and on the adjacent WWTP property. The investigation included LIF to determine the extent of the free product. The results of this investigation were utilized in completing the feasibility study.

**Feasibility Study** – WSP completed a feasibility study to evaluate remediation alternatives to remediate the free product on the WWTP property. WSP evaluated Excavation and Disposal, In-situ Carbon Adsorbent with Enhanced Biodegradation (BOS 200®), Surfactant Enhanced Vacuum Extraction, and Long-Term Monitoring. WSP presented the results of the feasibility study to EGLE, and EGLE determined that BOS 200 ® was the preferred remedy.

**Underground Utility Inspection and Survey** – WSP completed underground utility survey on the WWTP property. The utility locations were located using ground penetrating radar (GPR), staked and the type (water, sewer, etc.) were recorded. WSP exposed the utilities approximately every 15 linear feet and the size, material, and depth were recorded. Approximately 1000 linear feet of utilities were encountered. All soil cuttings were containerized, characterized, and disposed.

**Bench Study** - WSP completed a Bench Study using the BOS 200<sup>®</sup>. WSP collected and submitted a 500 milli-liter sample of light non-aqueous phase liquid (LNAPL) to AST to evaluate the dosing required based on short term adsorption of site LNAPL by the BOS 200<sup>®</sup> activated carbon. Data from Bench Study was used to determine the optimal injection loading of the BOS 200<sup>®</sup>.

**Pilot Study** - WSP completed a Pilot Study using BOS 200<sup>®</sup>. The Pilot Study consisted of 14 injection points to a depth of 15 feet below ground surface and installation of three monitoring wells. The results of the Study were used to determine the optimal injection pressure, radius of influence, and product quantities.

**WWTP Property Remediation Bid Specifications**–WSP developed detailed specifications in CSI format for use by EGLE to procure a remediation contractor. The package included estimated quantities for each pay item, sampling analysis reports, and the results of the Pilot Study. WSP also presented to the EGLE In-Sert committee and obtained approval for the BOS 200® remedy. WSP assisted EGLE with Trade Contractor procurement including issuing Addenda, review the bids, and recommending a contractor.

**WWTP Property Remediation Oversight** - WSP provided full-time oversight during the In-Situ remedy. Approximately 70,000 pounds of BOS200® was injected into 337 injection points during the implementation of the remedy. During the construction, additional areas around the WWTP building were remediated to capture the free product plume.

**Vapor Intrusion Investigation** – WSP completed a vapor intrusion assessment in and around the WWTP building. The vapor intrusion investigation included the installation of three shallow soil gas wells and six sub-slab soil vapor pins. Installation of wells/pins and sampling was completed in accordance with EGLE's "Guidance Document for the Vapor Intrusion Pathway". The soil gas wells and sub-slab soil vapor pins are currently being sampled quarterly for four years to evaluate the vapor intrusion pathway.

# **Michner Plating**

Key Personnel: Garret Bondy, Michael McGowan, Lindsey Selvig, Megan Cynar, Doug Saigh, Deanna Hutsell, Nate Peck, Leonard Mankowski Project Address: 506 N Mechanic Street, Jackson, Michigan, 49201 Owner/Client Contract Contact Name and Telephone: Raymond Govus; EGLE; 517-290-9074

#### **Relevance to Work Requested in RFP:**

- Brownfield Redevelopment
- Phase I Environmental Site Assessment (ESA)
- Phase II Environmental Site Assessment
- Regulated Waste Survey
- · Hazardous Building Materials Assessment
- · Vapor Intrusion Investigation and Mitigation System Install

**Description**—The property is located at 506 North Mechanic Street in Jackson County, Jackson, Michigan. Historical plating activities have resulted in contamination of soil and groundwater. The Site is bordered by commercial properties to the north, east, and south and by the Grand River on the west. The Site is approximately 4acres in size and developed with multiple commercial buildings totaling 137,000 square feet and ranging from single-story to threestory in size.

**Phase I ESA**—The Phase I ESA included review of historical documentation, interviewing past employees, site reconnaissance, title searches and regulatory environmental records. The Phase I ESA identified known environmental conditions or concerns associated with the Site, which included any recognized environmental conditions associated with the Site. WSP has performed this Phase I ESA in conformance with the scope and limitations of American Society of Testing and Materials (ASTM) Standard E 1527-13.

Phase II ESA—The Phase II ESA included installation of groundwater and soil gas monitoring wells; soil, groundwater, and soil gas sampling. WSP collected 12 soil samples, 10 groundwater, and three soil samples. Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), "Michigan 10" metals, cyanide, and polychlorinated biphenyl (PCB) compounds. Soil gas samples were analyzed for VOCs. Soil and groundwater analytical results



#### **Project Highlights**

- Former plating facility
- WSP conducted Phase I ESA
  WSP conducted Phase II ESA
- (soil, groundwater and soil gas)
- Site contaminated with metals, VOCs, SVOCs, chlorinated solvents, and PFAS
- WSP conducted regulated material survey
- WSP quantified building materials for future demolition specifications
- WSP completed a soil and groundwater investigation to
- delineate the extent of contamination
- Executed a vapor intrusion investigation to evaluate potential vapor intrusion risks throughout the site and surrounding area

exceeded the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 criteria for VOCs, SVOCs, metals, and cyanide. Soil gas analytical results exceeded the volatilization to indoor air pathway (VIAP) screening levels for VOCs.

**PFAS Investigation**—An investigation conducted by EGLE identified per- and polyfluoroalkyl substances (PFAS) in the groundwater at the site. At the request of EGLE, WSP collected samples from three monitoring wells, five surface water samples from the Grand River, and two water samples from the flooded basement. WSP completed follow up sampling on the site-wide monitor well network and identified PFAS in groundwater on and off-site. Based on the results of this sampling, WSP completed a water well survey to identify wells within a one-mile radius of the site.

Hazardous Building Materials Assessment—The Hazardous Building Materials Assessment was conducted by State of Michigan Certified Asbestos Building Inspectors and regulated materials experienced staff. Regulated materials that were sampled during this survey included asbestos

containing building materials, lead paint chips, stained concrete, painted brick/masonry, tank water, floor trench drain sludge, and stained surface for PCBs. Quantification of other regulated materials including but not limited to include assumed PCB-containing light ballasts, electric transformers, and mercury-containing fluorescent light tubes, switches, and thermostats, and other recognized universal wastes. WSP developed a work plan to develop bid specifications to remove and dispose the regulated materials and demolish the buildings.

**Environmental Investigation/Characterization**–WSP conducted site investigation activities to delineate the extent of VOCs, SVOCs, metals, and cyanide impacts on adjacent and nearby properties. Contaminant fate and transport was assessed for possible distribution into nearby water bodies (Grand River), and shallow groundwater. The investigation included soil borings and sampling, and groundwater monitoring well installation and sampling. Soil and groundwater sampling was done both on site and adjacent properties. Proper decontamination and disposal of investigative derived waste (IDW) were carried out throughout this investigation. Quarterly groundwater monitoring was completed to evaluate seasonal variability of contaminants in groundwater. WSP assisted EGLE with off-site property access and coordination with stakeholders for drilling and sampling events.

Vapor Intrusion Investigation—A soil gas survey was conducted on and off-site to aid in the identification of VOCs. To evaluate the potential vapor intrusion risks throughout the site and adjacent properties, WSP installed indoor air and soil vapor points on and around the site. Sampling was done in general conformance with EGLE's "Guidance Document for the Vapor Intrusion Pathway" (May 2013), as amended. Vapor mitigation systems were installed in two nearby residences based on soil vapor analytical results. Quarterly soil vapor sampling was completed to better understand the potential human health risks and further evaluation of additional nearby residences is currently being considered. WSP assisted EGLE with off-site property access and coordination with stakeholders for drilling and sampling events.

# Nuclear Fuel Facility Demolition and Sitewide Remediation

Key Personnel: Jeff Lively Project Address, City, State, Zip: Windsor, CT Contact Name and Telephone: Keith R. Knauerhase, 860.285.9694

#### **Relevance to Work Requested in RFP:**

- · Facility-wide investigation
- Pilot and treatability studies
- Excavation and disposal of radioactive soil and sediment
- Building demolition
- Utility inspection and removal
- Risk assessment
- · Remedial Design
- Construction Oversight
- Brook/river restoration

**Description**— From the late 1950s to 1990s, Combustion Engineering Inc. (CE, now ABB) performed research, development, engineering, production, and servicing of nuclear and fossil fuel systems at a 242 ha nuclear fuel facility located in a commercial area surrounded by a residential neighborhood in Windsor, Connecticut, USA. CE was a Government Contractor when performing the nuclear navy fuels processing work as an arm of the U.S. Atomic Energy Commission. CE ended fuel development operations in the 1990s, and ABB initiated remediation of plant facilities for residential and commercial redevelopment. Cleanup was eligible for partial reimbursement under U.S. federal Formerly Utilized Sites Remedial Action Program (FUSRAP). Throughout the project, the Windsor site continued to operate as a manufacturing facility with over 1,000 employees on-site.

There were 25 areas of concern that included a drum burial pit disposal area, brook shoreline and underwater area, buildings/former building sites, sewer/storm drains/piping, and open land. Residences abutted the site. Impacted media included soils, sediments, groundwater, air, sludge, surface water, and manmade structures. Contaminants were uranium, thorium, Cs-137, Co-60, polychlorinated biphenyls (PCBs), asbestos. mercury, lead, and perchlorate.

**Scope**— The WSP Team performed soil and sediment excavation, structure decontamination and demolition, infrastructure remediation, waste characterization, transportation and off-site disposal. Following remediation work, verification surveys were performed along with preparation of final remediation and verification reports to document that cleanup criteria had been achieved. After receiving regulatory approval that cleanup had been achieved, the sites were restored.



#### Project Highlights:

- Size: 242 ha former nuclear and fossil fuel facilities with highly enriched uranium (HEU) contamination
- Facility Types: Drum burial pit disposal area, Brook shoreline and underwater area, Buildings/former building sites, Sewer/storm drains/piping, Open land
- Media: Soils, Sediments, Groundwater, Air, Sludge, Surface water, Man-made structures
- Scope: Preparation of work documents, Radiological investigations/surveys, Remedial design, Implementation of radiological controls, Remedial/removal actions ID&D of radiologically impacted buildings and utilities, Remediation of groundwater, Pilot and treatability studies, Storage and handling of waste materials, Off-site disposal of radionuclide impacted soils and debris, Sampling and analysis, Stormwater management, Reporting
- Contaminants: Uranium, Thorium Cs-137, Co-60, PCBs, Asbestos, Mercury, Lead, Perchlorate
- Complexity: Complex regulatory framework to perform multiple remedial actions for free release and unrestricted reuse; site surrounded by residential community; project objective achieved – regulators approved free release of 242 ha for unrestricted future development.

As prime contractor, WSP planned, designed, and managed low level radioactive waste (LLRW) remediation of the radiological constituents and by-products (uranium, plutonium, radium, and thorium), PAH, POL, solvents, and metals using 25 construction subcontractors.

WSP performed historical records review, investigations, surveys, and health risk assessments; prepared project-specific plans (Health & Safety, Quality Assurance (QA), Radiation Protection, Waste Management, Demolition) and procedures; prepared the Project Execution Plan describing major work activities as well as methods, constraints, hazards, worker training, personal protection, and equipment to safely execute tasks through to completion; developed cost estimates and schedules; managed multiple specialty subcontractors performing field work; oversaw all field work to ensure compliance with plans and specifications; oversaw Health & Safety, QA and other program functions to ensure implementation of project-specific plans and compliance in the field. WSP performed verification surveys in addition to survey data evaluation and reporting. Each impacted area received a 100% surface scan in addition to collection and analysis of samples in the on-site laboratory following MARSSIM protocols. As a result, the site has been released for unrestricted reuse and is being redeveloped as a residential and commercial mixed-use community.

As prime contractor/program manager, WSP oversaw 25 specialty subcontractors who performed facility demolition and decommissioning, soil excavation, hazardous materials removal, structure/surface decontamination; removal of below-surface foundation, piping, utilities, and impacted soil; backfilling and restoration of building footprints; waste segregation for recycling or disposal; proper packaging and inventory of waste for transportation to disposal facility; and transportation of waste to waste disposal facilities.

Disposal volumes included 6,000 tons of radiological impacted debris, 10,200 tons of radiological impacted soil, and 6,300 tons of chemical impacted soil, all disposed off-site at appropriate facilities. D&D included removing and packaging 2,300 tons of hazardous waste and 1,300 cubic meters (m<sup>3</sup>) asbestos containing material and transported it to a licensed facility for disposal; removing and packaging 6,000 tons of LLRW and transported it via truck and then by rail to licensed facility for disposal; removing 1,000 m<sup>3</sup> of contaminated underground industrial waste and sanitary sewer lines; removing 20,000 tons construction and demolition waste; and removing 1,800 tons of recyclable scrap metal.

Innovations for groundwater remediation included conducting two pilot studies (in situ chemical oxidation and bioremediation). Innovations in radiological waste minimization were implemented to minimize volume requiring off-site disposal such as survey of individual pieces of equipment and removal of sediment within piping to enable disposal of equipment as non-radioactive waste. A value engineering evaluation was also performed for the brook remediation where both a vacuum-based and an excavation-based system were evaluated.

After remediation and verifications were complete, WSP oversaw restoration of disturbed areas in accordance with the approved Backfill and Restoration Plan. Areas were graded to drain, covered with topsoil and stabilized with seed, fertilizer and mulch. We ensured that erosion control best management practices were performed to prevent sediment runoff while vegetation became established. We oversaw restoration of excavated and disturbed segments of the Site Brook with substrate closely matching that which had been removed. The stream channel was reconstructed to closely match the existing channel. As part of the design, manufactured wetland soil was used on-site using a mixture of organic material and mineral soil. A wetland seed mixture was sown to promote revegetation of disturbed areas, and woody debris was used to stabilize the wetland soil. Mulch and leaf litter were used to stabilize disturbed upland areas. Following restoration, land areas were ready for unrestricted reuse.

# LLRW Waste Remediation and Long Term Waste Management Facility (LTWMF) Construction

Key Personnel: Jeff Lively Project Address, City, State, Zip: Port Granby, Ontario CA Contact Name and Telephone: Jordan Wilson, 905-373-6372

#### **Relevance to Work Requested in RFP:**

- · Soil, waste, sediment and groundwater sampling
- Landfill cell construction to encapsulate radioactive waste
- · Design
- Building demolition
- · Construction oversight

**Description**— The Port Granby Project is a Canadian federal initiative for the cleanup and safe long-term management of historic low-level radioactive waste (LLRW) generated from radium and uranium refining operations of the former Eldorado Nuclear Limited refinery in Port Hope and placed in about 80 trenches along the bluffs of Lake Ontario. The waste site is known as the Port Granby Waste Management Facility (PGWMF) which is about 17.5 ha and situated along 400 meters of receding shoreline, 30-meterhigh eroding bluffs and porous sandy soils. Under license with the Canadian Nuclear Safety Commission (CNSC) for site maintenance and monitoring since 1988, Cameco Corporation made environmental improvements, but the unstable terrain and close proximity to Lake Ontario made the site inconducive to long-term waste storage.

After years of careful planning there are many stakeholders heavily invested in the success of the Port Hope Area Initiative and the Port Granby Project.

**Scope**— In 2015, WSP was contracted by Canadian National Laboratory (CNL) to construct the Port Granby Long Term Waste Management Facility (LTWMF), remediate the historic LLRW and industrial waste from the PGWMF, and restore the PGWMF site. As prime contractor, WSP brought together a combination of in-house technical and management disciplines and hired specialty subcontractors with unique and complementary skills to provide the best solution for CNL.

Areas of Responsibility– WSP is self-performing overall project management, value engineering, health & safety, radiation protection, environmental, quality assurance/quality control (QA/QC), waste excavation/hauling, and construction management. WSP subcontracted landfill civil construction, electrical, mechanical scopes, containment cell base liner and cover installations, and niche capabilities.





#### **Project Highlights:**

- Size: 17.5 ha situated along 400 meters of receding shoreline, 30metre high eroding bluffs and porous sandy soils.
- porous sandy soils. Facility Types: Waste burial area, Small buildings, Holding ponds, Piping
- Media: Soils, Groundwater, Air, Surface water, Man-made structures
- Scope: Prepare work documents, Excavate, truck loading, waste hauling to LTWMF, D&D of buildings and utilities, Storage and handling of waste materials, Construction of long term management facility, Sampling and analysis, Stormwater management, Reporting
- Contaminants: Raffinate (byproduct from refining of uranium ores and concentrates); Radium-226; calcium sulphate, calcium hydroxide and various salts, Calcium fluoride from uranium hexafluoride production, Mixed chemical waste with residues of silver, radium, cobalt, zirconium, and magnesium fluoride; beryllium and aluminum wastes; ammonium nitrate liquid
- Complexity: Excavation area had steep bluffs along Lake Ontario; heterogeneous waste posed radiological waste characterization challenges; work performed during wettest year on record; multiple stakeholders

WSP developed project-related plans and work packages in collaboration with subcontractors and ensured personnel training commensurate with job responsibilities prior to the start of field work. WSP managed construction labor and supervision; held daily safety tailgate meetings with all field personnel; oversaw construction activities to enforce strict adherence to activity work packages, WSP's programs and contract specifications; documented field changes; and inspected field work from start to verification/acceptance.

#### **Key Technical Features**

**Design**: WSP value engineered a solution for redesign of the underpass under Lakeshore Road to include more efficient construction and added a tunnel lane to allow more trucks to pass through to accelerate the schedule. This solution saved about \$440k.

**Remediation**: WSP constructed facility infrastructure to support LTWMF construction and waste hauling and placement operations. This involved construction of haul roads, an underpass, and ancillary buildings (trailers for contractor, CNL and workers) as well as decontamination pads, equipment maintenance and fuel station, material storage areas, scales, equipment and rad monitoring portals, mud mats, and stockpile areas.

WSP procured and installed the LTWMF multi-layer liner system for containment of LLRW that included 117,710 m<sup>2</sup> of geosynthetic clay liner; 97,100 m<sup>2</sup> of 80 mil HDPE for base liner system; 97,100 m<sup>2</sup> of Triplanar Geocomposite for base liner system; and 99,500 m<sup>2</sup> of Biplanar Geocomposite for base liner system. A standalone leachate collection system was installed along with riser and control houses, conveyance piping, electrical controls related to leachate removal, sump cleaning, and pump maintenance.

WSP completed excavating ~1.3 million tons of LLRW, hazardous, and industrial waste, transporting and placing in the newly constructed Engineered Containment Mound (ECM) for long-term storage. Excavations at the PGWMF were sequenced in phases to minimize the amount of surface run-off requiring treatment during the different stages of excavation and to improve slope stability. Waste excavation used GPS-equipped excavator and bulldozer working in tandem to excavate trenches, mixing waste for optimum consistency, and loading haul trucks. Haul trucks traveled on temporary haul roads and turning areas (e.g., composite mats) in the PGWMF to prevent traveling on waste material. To maximize efficiency, backfilling and compaction occurred after the entire phase was verified as clean. All waste excavations were monitored by a Hazardous Waste Specialist to identify hazardous or potential hazardous materials requiring special handling procedures. WSP installed and maintained common utilities; installed and maintained ancillary buildings (trailer complexes, kiosk, equipment maintenance and fuel station), material storage areas, scales, mud mats, and stockpile areas. The waste was excavated to design grades with completed excavations scanned with portable gamma survey meters and select samples taken for alpha spectroscopy using an on-site portable laboratory. Once the excavation was deemed "clean," a written request was provided for confirmatory sampling with a smaller excavator and haul truck to address any hot spots identified during confirmatory sampling.

WSP is currently completing capping of the LTWMF after which site restoration activities will be performed such as final grading and planting vegetation.

### **Rose Lake Shooting Range**

Key Personnel: Garret Bondy, Anita Emery-DeVisser, Michael McGowan, Justin Gal, Nate Peck Project Address: Bath, Michigan

Owner/Client Contract Contact Name and Telephone: Michelle Crook, MDNR; (517) 243-3773

#### **Relevance to Work Requested in RFP:**

- Soil Investigation to Characterize Nature and Extent of Lead Impacts
- Human Health Risk Assessment
- Ecological Risk Assessment.
- Treatability Study
- Focused Feasibility Study

**Description**—The former Rose Lake Wildlife Research Area Shooting Range (RLSR) site is located within the Rose Lake Wildlife Research Area, Bath Township, Clinton County, Michigan. The former shooting range is situated in a rural residential area. The range has been inactive since 1996, and a new range was constructed one mile southeast of the former RLSR. The Michigan Department of Natural Resources (MDNR) completed a limited Environmental Site Assessment in 1998. Results from this study indicated that lead impacted soils and wetland sediments were present and required further investigation.

**Scope of Work**—The overall goal of the project is to remove source area soils that contain the highest concentrations of lead, thereby mitigating risks to exposure of lead shot and lead-contaminated soils. WSP's scope of work included characterizing the nature and extent of lead in soil and the exposure risk for ecological and human receptors. The scope also included evaluating remedial alternatives, preparing a focused feasibility study with the end goal of supporting the MDNR in removing contaminated soils containing the highest lead concentrations.

**Soil Investigation**—Based on historical aerial photographs, shooting range use information and site observations, WSP developed a sampling grid that encompassed the shot fall zone and perimeter areas. A scrub/shrub wetland occupies a majority of the downrange shot fall zone. Soil samples were collected from the



#### **Project Highlights**

- Former Rose Lake Shooting Range is an inactive skeet/trap range
- Characterized nature and extent of lead impacted soils in downrange area.
- Trapping shrew and mice to evaluate food chain
- Conducted Site-Specific HHRA and Phase I and II BERA to evaluate risk and guide selection of remedial alternatives.
- Refined area requiring remediation using incremental sampling
- Treatability study conducted on wetland and upland soils using various stabilizing agents to reduce leach potential.

downrange area; incremental sampling methods, and discrete sampling methods were used to characterize contamination within the wetland areas and upland areas. Once the horizontal and vertical extent of lead impacts was determined, toxicity characteristic leaching procedure (TCLP) analyses were conducted on those samples exhibiting the highest total lead concentrations. The distribution of lead contamination in soils follows a predicted shot fall pattern for a hand trap and skeet range. Concentrations of lead in soil exceeded Part 201 Generic Cleanup levels, including direct contact criterion.

**Ecological Risk Assessment**–Based on planned future use of the site as part of the State Game Area, WSP conducted several ecological risk assessments. A Screening Level Environmental Risk Assessment (SLERA) was conducted using existing literature for the most likely encountered ecological receptors. Following this evaluation, a Baseline Environmental Risk Assessment (BERA) was performed which involved trapping shrews and mice from various locations within the shot-fall zone, then evaluating the lead concentrations that were found in the animals and effect on the food chain. Using this information, an ecological risk based Preliminary Remedial Goals (PRGs) for lead in upland and wetland soil at the Former Rose Lake Shooting Range was developed. Human Health Risk Assessment—In addition to the ecological risk assessments, a human health risk assessment (HHRA) was also conducted. The objective of the HHRA is to evaluate the risk of harm to human health due to exposure to lead in soil via the direct contact pathway. The HHRA was performed using the United States Environmental Protection Agency guidance regarding human health exposure to lead in soil. No risk was found for the hunter scenario or the recreational user of the Rose Lake Wildlife Area.

**Treatability Studies**—Treatability studies were conducted on upland and wetland soils to test whether low level thermal remediation would be a viable solution. Additionally, several different types and concentrations of soil amendments were tested to compare leaching results. Treatability study objectives were to identify amendments which would stabilize the soils such that they would be classified as non-hazardous and not require disposal as hazardous waste.

**Feasibility Study**—Results of the risk assessments guided the evaluation of remedial alternatives in the Focused Feasibility Study. Ecological project remedial cleanup goals (PRGs) were calculated based on the BERA results. and will drive the site cleanup. Thus far, the alternatives evaluation has included insitu and ex-situ stabilization, thermal destruction, dig and haul, and a combination of alternatives including re-use of a portion of the site as a rifle range.

### Spartan Chemical Superfund Site

Key Personnel: Garret Bondy, Michael McGowan, Megan Cynar, Leonard Mankowski, Justin Gal, Doug Saigh, Deanna Hutsell, Nick Rogers, Steve Murray, Anita DeVisser, Jeshua Hansen, Lindsey Selvig, Nate Peck Project Address: 2538 28th Street, Wyoming, MI 49509

Owner/Client Contract Contact Name & Telephone: Erik Martinson; EGLE Superfund Section; (517) 285-3978

#### **Relevance to Work Requested in RFP:**

- Geophysical Investigation
- Soil and Hydrogeologic Investigation
- Feasibility Studies
- · Vapor Intrusion and Ambient Air Investigations
- Air sparge/Soil vapor extraction (AS/SVE) pilot study
- In-situ chemical oxidation (ISCO) bench and pilot studies
- · Vapor Emissions pilot study
- Remedial Design Specifications
- · Regulated Materials Survey
- · Monitoring Well Abandonment
- · Community Relations

**Description**—This former bulk chemical transfer facility is located on five acres in a mixed commercial, industrial, residential area with a high school located across an adjacent railroad right-of-way. Contaminated soil, soil gas, and groundwater have been documented on and off Site, with volatile organic compounds (VOCs) in groundwater and with metals in soils. The Final Record of Decision (ROD) specifies institutional controls, principal threat waste soils removal, soil vapor extraction (SVE) to control mitigation of vapors, air sparge (AS)/SVE for shallow source area groundwater and soil treatment, in-situ chemical oxidation for source area groundwater and deep groundwater treatment, enhanced in-situ biological treatment, and maintained natural attenuation of groundwater. The ROD was amended to include remedial excavation activities.

**Geophysical Investigation**–WSP personnel conducted a geophysical survey in the residential neighborhood down gradient of the site. The survey was used to determine top of bedrock and any preferential pathways for contaminant migration. The survey extended 1,800 linear feet and three residential streets were intermittently closed. WSP acquired the permit from the City of Wyoming to close streets.

**Soil and Hydrogeologic Investigation**—To reduce the volume of Resource Conservation Recovery Act (RCRA) soil, WSP conducted a soil investigation to further delineate RCRA hazardous and non-hazardous



#### Project Highlights

- Soil investigation to limit volume of RCRA soil to reduce <u>remedial costs.</u>
- Completed two Feasibility Studies
- Ambient air investigationone of first in Michigan.
- Completed indoor air survey within residential properties and manufacturing buildings
- Completed several soil gas
  surveys.
- Completed Regulated
  Materials Survey.
- Completed pilot studies for AS/SVE and soil and vapor treatability.
- Completed remedial design specs for SVE and excavation.
- Abandoned 27 groundwater wells and 3
- nested soil gas wells.

soils. WSP utilized a photo-ionization detector (PID) to screen the soil samples for VOCs prior to sample collection. Samples were collected using a Geoprobe ® and samples were submitted to the State Laboratory. In addition, 14 test pits were excavated in Occupational Safety and Health Administration (OSHA) Level B personal protective equipment (PPE), due to potentially high levels of VOCs. During the test pit activities, WSP collected perimeter air samples and analyzed the samples for VOCs with an onsite gas chromatograph. The soil analytical results were compared to State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 criteria and RCRA toxicity characteristic leaching procedure (TCLP) levels. Through the investigation efforts, WSP reduced the volume of RCRA soil by 400 cubic yards.

WSP conducted four semi-annual groundwater sampling events on the Site and in the surrounding neighborhood. WSP also completed and submitted technical memorandums detailed the sampling results for each event. The final technical memorandum included historical data evaluation and a

contaminant trend analysis. WSP also conducted a monitoring well assessment and submitted a report recommending well repairs, replacements, abandonments, and additions.

**Feasibility Studies**—WSP developed two feasibility studies (FSs) for this project. The first FS compared several technologies to remediate the soil and shallow groundwater on the southern half of the site. The technologies included excavation, AS/SVE, and a combination of the two technologies. The second FS compared several technologies to reduce the vapor emissions during excavation activities. The technologies included full enclosure of the excavation with vapor treatment, vapor suppression systems using surfactants, and vapor suppression systems using foaming agents.

Vapor Intrusion Studies–WSP conducted multiple assessments of vapor intrusion risks associated with contaminated soil, soil gas, and groundwater at several industrial properties, a high school, and a residential neighborhood impacted by contamination originating at this Federally-funded State-lead Superfund site. Elevated concentrations of VOCs were detected in soil gas around and beneath an active industrial building, and WSP assisted EGLE by preparing scopes of work for the necessary soil gas and indoor air sampling programs and by providing technical support during negotiations for site access. The analytical results were compared to applicable screening levels and used during the design of the SVE system. Based on the analytical results, WSP installed and sampled additional vapor monitoring points around the two adjacent industrial properties, and on the school property. WSP also installed and sampled sub-slab vapor pins in the two adjacent industrial properties and the school.

**Indoor Air Studies**—WSP designed and implemented indoor air studies in an active industrial facility and in six residences situated above the VOCs plume. Two rounds of indoor air samples were collected using Summa canisters. WSP also collected one round of indoor air sampling in a second adjoining industrial facility using Summa canisters. The data was compared to applicable screening levels to evaluate potential acute and chronic exposure risks.

AS/SVE Pilot Study—WSP conducted an AS/SVE Pilot Study to obtain information that was used to design a full-scale system. Using a network of specially-installed vapor extraction wells and observation points, WSP measured air flow rates, vacuum, and groundwater levels at various distances to properly size the remediation equipment and optimize AS/SVE well configuration.

**Remedial Design**–WSP developed separate design packages for soil excavation, SVE, AS/SVE, and ISCO. The SVE system is intended to mitigate vapor intrusion risks at an active industrial facility by maintaining a vacuum beneath the foundation.

Additional Design packages included the treatability pilot study and a full-scale remedial excavation of the southern half of the site. Technical specifications followed the Construction Specifications Institute format, and bid packages incorporated standard Department of Technology, Management and Budget contract documents.

**Excavation Trade Contractor Procurement**–WSP provided procurement assistance including preparation of the advertisement, pre-bid meeting, issuance of addendum, pre-award meeting with the apparent low bidder, review of low bidders' references, completion of a bid tabulation comparing bids and to identify bid discrepancies, preparation of the contract form, and recommendation.

**Initial Excavation Remedial Construction**–WSP observed and documented the excavation activities. Construction activities included concrete removal and soil excavation. WSP developed perimeter air monitoring action levels (ALs) to be protective of the community from fugitive VOC emissions leaving the site during site activities. ALs were developed for multiple scenarios, including Tier I and II Acute Actions Levels; Subchronic ALs, and Chronic ALs. WSP collected perimeter air samples and conducted onsite analysis using a portable gas chromatograph. WSP also collected air samples in Bottle-Vacs<sup>™</sup> and for analysis at the State laboratory. During the excavation, significant soil contamination not identified in the ROD was encountered. The project was shut down and WSP conducted an emergency response investigation and construction activities.

**Emergency Response**—WSP observed discolored soils the Excavation Remedial Construction activities. Analytical results of the discolored soils exceeded RCRA TCLP limits for metals and VOCs. WSP also utilized an x-ray fluorescence (XRF) to screen soils. XRF results indicated high levels of metals. Due to the high levels of VOCs, EGLE contracted a firm to perform test pitting and trenching to visually evaluate subsurface material and collect analytical samples. Due to the discontinuous nature of the discolored soils, test pitting was selected instead of drilling methods. Based on elevated VOCs detected in unexpected areas during surficial sampling, all personnel in the work zone donned Level B PPE. Analytical results of the test pit soils exceeded RCRA TCLP limits for metals and VOCs. To prevent offsite migration of VOCs from soil exposed during concrete removal, a cap was installed. The cap consisted of a minimum of six inches of sand as a base layer, followed by a geosynthetic clay liner (GCL). The cap was covered by another six inches of soil and seeded.

**Treatability Pilot Study**– WSP completed a pilot study to evaluate various methods to control emissions during soil excavation and stabilization. Three methods for controlling VOC emissions were evaluated: foam Suppressant (Rusmar RusFoam® OC), liquid surfactant (Biosolve Pinkwater®), and a temporary structure fitted with VOC filtering air handling units. To evaluate each method four excavations were completed to remove areas of principal waste. At least one of the methods was used at each of the excavations. Liquid surfactant was used to suppress airborne VOC vapors at the perimeter of the excavations. Perimeter ambient air was monitored by WSP using a portable gas chromatograph to evaluate the effectiveness of each vapor mitigation method.

**Regulated Material Survey**– WSP completed a Regulated Materials Survey (RMS) of the existing buildings on site. WSP recommended these structures be demolished as part of the full-scale remedial excavation. The RMS included identifying, quantifying, and sampling suspect asbestos containing materials (ACMs), concrete, brick/masonry, and storage drum contents. The RMS also included quantification of other regulated materials including, but not limited to, polychlorinated biphenyl (PCB)-containing light ballasts and electric transformers, mercury-containing fluorescent light tubes, switches, and thermostats, and a preliminary inventory of recognized universal wastes.

**Well Abandonment**—In preparation for the Full-Scale Remedial Excavation, WSP abandoned the groundwater monitoring wells within the footprint of the proposed excavation. WSP oversaw the surveying and decommissioning of 27 groundwater wells. Three nested soil gas wells were also abandoned. Each well was vertical surveyed measuring ground surface elevation to +/- 0.1 foot and top of well casing elevation to =/- 0.1 foot and referenced to NAVD88. The horizontal survey was located to +/- 0.1 foot and referenced to the NAD83 State Plane coordinate system. The depth to bottom and depth to water were collected from each monitoring prior to abandonment. Monitoring well were removed from ground where possible or abandoned in place using a tremie pipe and cement grout.

**Full Scale Remedial Excavation Design**–WSP is currently working on the bidding package to complete the Full-Scale Remedial Excavation of the southern half of the site. WSP will assist EGLE in procurement activities, will provide oversight, and will provide ambient air monitoring during these activities. The remedial excavation will include a vapor suppression to mitigate offsite emissions, and soil amendments to reduce metals and VOCs contamination to below RCRA TCLP limits.

**Community Relations**—WSP assisted EGLE and the United States Environmental Protection Agency in presenting study results at two public meetings. Following the public meeting, WSP collected indoor air samples in the residences down gradient of the site. WSP prepared a letter for release by EGLE requesting access to sample indoor air the basements of the private homes. WSP met with each homeowner to get their permission and explain the sampling. WSP subsequently collected two rounds of indoor air samples.

# **Telecraft Shopping Center**

Key Personnel: Garret Bondy, Nick Rogers, Anita Emery-DeVisser, Deanna Hutsell, Megan Cynar, Project Address, City, State, Zip: 14110 Telegraph Rd, Redford, Michigan Contact Name and Telephone: Beth Vens, EGLE Remediation and Redevelopment Division; (586) 484-1030

#### **Relevance to Work Requested in RFP:**

- Environmental Investigation and Characterization
- · Utilized GPR to Locate Underground Utilities
- Vapor Intrusion (VI) Investigation
- Sewer Camera Investigation

**Description**— The Site is located within a commercial strip mall. A dry cleaner historically operated at 14110 Telegraph Road from 1958 until the 1960s that appears to have had historical releases at the Site. Additionally, a heating oil underground storage tank (UST) was historically located at the Site, which was reportedly removed on an unknown date.

The former dry cleaner is suspected to be the contaminant source. Concentrations of tetrachloroethylene (PCE) were found up to 8,000 micrograms per liter ( $\mu$ g/L) in groundwater immediately adjacent to the UST excavation, and at 2,000  $\mu$ g/L approximately 75 feet (ft) north (downgradient) of the excavation at the property boundary. To the east of the site property is the boundary between the City of Redford and the City of Detroit. Immediately downgradient of the Site (adjacent to the east of the Site) and located in the City of Detroit, is a residential complex named Infinity Park Apartments and Townhomes (the residential complex). Northeast of the residential complex, approximately 1,000 ft downgradient of the Site lies the Rouge River as it passes through Eliza Howell Park. North of the Site is a church located at 14152 Telegraph Road

**Environmental Investigation/Characterization**–WSP completed an investigation to define the extent and distribution of dissolved contaminants in groundwater in order to identify mitigation options to protect the groundwater surface water interface (GSI) at



#### Project Highlights:

- Installation of monitor wells and soil vapor sampling points
- GSI and VI evaluation through soil, groundwater, and soil vapor sampling
- Quarterly groundwater and soil vapor sampling to establish contaminant trends
- Completed vapor sampling and camera survey of sewers to evaluate VI pathway

the Rouge River. WSP collected soil samples and oversaw the installation of 23 permanent monitoring wells. Quarterly groundwater sampling for volatile organic compounds (VOCs) is ongoing. Soil, groundwater, and soil vapor data collected is currently being evaluated by the project team for use in preparation of a focused feasibility study.

**Vapor Intrusion Investigation**— WSP completed an investigation to evaluate the potential inhalation exposure to PCE via the volatilization to indoor air pathway (VIAP). WSP oversaw the installation of 14 soil vapor points. WSP conducted quarterly soil vapor sampling for VOCs. Evaluation of the vapor intrusion pathway related to shallow groundwater on the adjacent residential apartment complex is ongoing, as well as quarterly soil vapor sampling.

**Sewer Camera Investigation**– Additional assessment of the soil vapor pathway was conducted at the apartment complex by a camera survey within the combined storm and sanitary sewer lines and completing one year of quarterly vapor sampling within the lines. Evaluation of the vapor intrusion pathway related to shallow groundwater on the adjacent residential apartment complex is ongoing.

# USDOE Moab Uranium Mill Tailings Remediation

Key Personnel: Jeff Lively Project Address, City, State, Zip: Moab, Utah Contact Name and Telephone: Russ McCallister, 859-227-5016

#### **Relevance to Work Requested in RFP:**

- Soil, sediment dust, surface water and groundwater sampling
- · Landfilling radioactive waste
- Monitoring landfill cells
- · Remedial design
- · Construction oversight

**Description**— In 2001, the Department of Energy (DOE) assumed responsibility for this former uranium ore processing facility under Title 1 of the Uranium Mill Tailings Radiation Control Act. The site encompasses 194 ha, of which approximately 53 ha was covered by a 14.5 million ton uranium mill tailings [residual radioactive material (RRM)] pile, and associated mill demolition debris buried in the pile. Remediation activities and development of the infrastructure began in 2008 by a previous large business contractor. In 2011, Portage (a small business) assumed responsibility as the Remedial Action Contractor (RAC) for the site. WSP was a subcontractor to North Wind Portage and shared contract work responsibilities for engineering, industrial hygiene, radiological, and site support.

**Scope**— At the Moab Site, RRM was excavated/conditioned and placed in intermodal containers along with debris from the mill buildings and associated structures buried in the tailings pile. The waste was then transported 48 km from Moab to Crescent Junction via rail and disposed in an USNRC-regulated engineered disposal cells at the Crescent Junction disposal facility. Moab Site restoration will reclaim the Moab Site to appropriate standards (including demolition of man-made structures).

Areas of Responsibility– For this large-scale remediation effort, WSP was a subcontractor to North Wind Portage. WSP's areas of responsibility included performing industrial hygiene, health & safety, radiation protection, quality assurance (QA), site security, environmental monitoring, and maintenance. WSP oversaw dust suppression and monitoring to protect workers and nearby residents; performed sampling and analysis activities for air monitoring, radiological monitoring, and meteorological monitoring; and implemented the Radiation Protection Program. WSP personnel consisted of 30% of the overall project workforce of about 115 onsite personnel.

#### **Key Technical Features**

**Design:** In 2011, WSP and North Wind jointly prepared a Moab Excavation Plan that described the design and approach to excavate RRM tailings and debris, handling of tailings and debris at the Moab Site, and the management of the evaporation pond and clean water construction ponds. WSP evaluated geotechnical cross-





#### Project Highlights:

- Size: Moab site encompasses 194 ha, of which approximately 53 ha is covered by a uranium mill tailings pile
- Facility Types: Uranium Mill Tailings Pile, Man-made structures
- Media: Soils, Sediments, Groundwater, Debris, Uranium mill tailings, Surface water, Manmade structures
- Scope: Excavation, conditioning, packaging of uranium mill tailings and debris at the Moab site, transporting the waste via Crescent Junction disposal facility, a USNRC-regulated disposal facility operated by North Wind Portage and WSP (subcontractor) Scope: Work documents, Implement radiological controls and H&S, Onsite radiological surveys and sampling and analysis, Assist with removal actions, Expedited and emergency response actions, Remedial systems O&M, Surveys, Storage and handling waste materials, Reporting
- Contaminants: Total Uranium, Th-230, Ra-226, Po-210, Radon
- Complexity: Large-scale construction remediation project including excavation, shoring, water management, waste conditioning, waste packaging, transportation, and off-site disposal of radioactively contaminated soils and debris. Site is under high level of visibility and located in a rural/residential environment immediately north of the City of Moab, adjacent to the Colorado River, and across from the entrance to Arches National Park

sections showing the amount of sand, transition, and slime tailings to ensure that we excavated and conditioned these materials in roughly equal volumes. WSP prepared a plan and ensured containment and stabilization of the RRM and minimized fugitive emissions by constructing, maintaining, strengthening, or applying earthen dikes around the pile to prevent a release outside the excavation area, sediment retention basins, drainage ditches and culverts, and dust suppression materials.

**Remediation:** Excavation of Ra-226 (uranium) contaminated soil at the Moab Site required an equal blend of sand, lime, and transition materials to achieve required moisture-to-Ra-226 content before shipment and waste placement. RRM was dewatered (conditioned) and arranged in drying beds to reduce the high-moisture content. After conditioning, content was loaded into haul trucks, which were weighed, washed, and surveyed for radioactive contamination on outer surfaces prior to release to the rail load-out area. After a train was loaded, WSP inspected it, processed paperwork, and transported via railroad to Crescent Junction for disposal. Sampling and analysis activities were consistently performed for air, radiological, and meteorological monitoring, and waste management.

Each workday, the team loaded and shipped 4,500 tons of RRM via a dedicated train to the Crescent Junction disposal facility. Each shipment of 34 railcars had 136 containers. Upon arrival, waste was placed in disposal cells and tested for compliance with NRC disposal requirements. Once a cell was filled, the waste was capped with an engineered landfill cover. As cells were filled, new cells were constructed to expand capacity as required. The most recent cell expansion consisted of excavating a 20 ha cell footprint down 7.5 m into shale bedrock, removing 1.4 million m<sup>3</sup> of soil and placing 2.7 million m<sup>3</sup> of RRM waste. The waste cells are capped with multiple layers of soil and rock – fill, shale (radon barrier), sand gravel (infiltration and bio intrusion barrier), shale (frost protection barrier), rock, and vegetative cover. WSP regularly inspected and maintained the cover as part of ongoing landfill operations. WSP also supported remedial activities in vicinity properties in the local community contaminated from previous mill activities.

The Moab WSP Team worked 258,674 hours between 2016 through 2020 (five years) with lost time injury rate (LTIR) of 0.77 and total recordable incident rate (TRIR) of 1.55.

### Wickes Manufacturing TCE Plume Site RI/FS

Key Personnel: Garret Bondy, Steve Murray, Michael McGowan, Dave Woodward, Leonard Mankowski, Nate Peck, Jason Grahn

Project Address: 310 Palmer Park Road, Mancelona, Michigan Owner/Client Contract Contact Name and Telephone: Janice Adams; EGLE; 989-705-3434

#### **Relevance to Work Requested in RFP:**

- Remedial Investigation/Feasibility Study
- · Geophysical Survey
- · Rotosonic Drilling and Well Abandonment
- · Vertical Aquifer Sampling
- · Regional 3D Groundwater Modeling
- Community Relations Support
- · Vapor Intrusion Assessment and Mitigation System Install
- Surface Water Assessment

**Site Description**—Chlorinated solvents affected groundwater from the Mancelona Plant to the Shanty Creek Resort, approximately 6.3 miles away. At the leading edge, the contaminated groundwater plume is 1.5-mile wide and reaches depths of 500 feet (ft).

**Source Area Investigation**—Based on a review of historical records, the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) and WSP identified several potential source areas at the Mancelona Plant: two Former Scrap Metal Staging Areas, two Possible Former trichloroethylene (TCE) Disposal Locations, three Former Untreated Waste Seepage Lagoons, and one Former Drum Storage Area. EM-31 resistivity survey was performed to guide subsequent soil, soil vapor and groundwater studies beneath the Former Manufacturing Site.

Contractor Procurement for Drilling and Sampling Program–WSP Developed detailed specifications in Construction Specifications Institute (CSI) format using MICHSPEC<sup>™</sup> contract documents for



Project Highlights

- High-profile investigation of a
  6.3 mi. long, 1.5 mi. wide, 500
  ft. deep TCE plume.
- Used geophysics to define geologic features to depths of 500 ft., saving more than \$600,000 in drilling costs.
- Conducted extensive
  community relations
  program.
- Investigations, modeling used to help EGLE and local health officials in providing stakeholder updates and evaluating need to extend municipal water.

Michigan Department of Technology, Management, and Budget (DTMB) to procure a rotosonic contractor for a million-dollar drilling program. Rotosonic drilling was selected for its ability to sample soil and groundwater in sand aquifers to depths greater than 600 ft. WSP led the pre-bid meeting, issued addenda, reviewed bids, and recommended contract award. Subsequent phases of well installation performed with combination of mud rotary drilling and use of EGLE Gamma Logging Services. This method saved over \$50K per well location of rotosonic drilling method.

**Surface Geophysical Survey**—The size and depth of the contaminant plume made delineation costly and time consuming. WSP recommended using indirect geophysical methods for data acquisition to focus the investigation program for maximum cost effectiveness. EM-31 resistivity survey for characterization to 15 ft. at source areas. Direct current resistivity and induced polarization methods were selected to obtain vertical profiles of the aquifer to depths of 200 ft. (130 ft. below the water table). Over 20,000 linear ft. of seismic shear-wave vertical profile data were collected. The geophysical survey located zones within the drift aquifer that provided preferential pathways for contaminant migration and defined extent of confining units to depths of 500 ft.

**Soil Vapor and Groundwater Investigation**—A total of 16 shallow and 18 nested soil gas probes were installed and sampled adjacent to source area and along the axis for groundwater plume to evaluate vapor intrusion pathway at the Site and for downgradient residential properties. WSP managed the drilling contractor during plume delineation and the installation of 60 monitoring wells. Over 180 groundwater "vertical aquifer samples" were collected to place well screens at highest TCE concentrations. WSP recommended using passive diffusion bag samplers for groundwater monitoring

which reduced annual sample collection costs by 25%. Large scale pressure transducer testing was performed to better understand the effect of water supply well pumping on the different aquifers affected by the TCE plume. A river hydrology and flow studies were performed to better understand the influence of recharging groundwater on the shallow TCE impacted aquifers.

**Design and Construct Vapor Mitigation Systems**-WSP performed pressure field testing beneath the build's floor slabs to support the design of sub-slab depressurization systems at three commercial properties in Mancelona where vapor intrusion pathways were found complete from groundwater volatilization. Systems were constructed and operated for a year period. WSP developed operation and maintenance plans for property owners to continue system operations.

**Surface Water Assessment**—WSP developed a program to monitoring the TCE plume as it vents into the Cedar River. Sampling consisted of near bank groundwater grab sample, pore water samples from beneath the Cedar River and surface water sample from the cedar at for nested locations where the north lobe of the TCE plume vents to the Cedar River. Long term demonstration of groundwater surface water compliance has been documented. WSP also performed a hydraulic Stream Assessment at the Shanty Creek head waters. This program consisted of installing staff gauges along the Creek to measure stream elevational changes and performing cross sectional profile of stream flow velocities/volumes with Hach FH950 velocity flow meter. Section of creek where TCE plume is heading was found to be gaining approximately 3,200 gallons per minute along a first 2,000 feet of Shanty Creek.

**Regional Groundwater Model**—WSP developed a 3-D model to simulate groundwater flow and contaminant fate and transport. The model was calibrated using field observations and refined using data from supplemental investigations. The movement of the plume was simulated over time to evaluate potential impacts to receptors such as water-supply wells and nearby surface water bodies. These results were used to help the water supply well operators to reduce pumping rates of wells near the leading edge of the plume to reduce potential for altering plume migration path. The model was also used to compare cleanup alternatives during feasibility study and to present conceptual site model during public meetings with stakeholders.

**Feasibility Study**—Concurrent with site characterization, WSP evaluated technologies for addressing the plume and source areas. A Part 201 pathways evaluation was conducted to identify potential exposure routes and receptors. The evaluation suggested that a combination of different approaches may be appropriate to prevent exposures to groundwater in the source area, at the leading edge of the plume, and in the area between them. Consideration was given to innovative technologies, such as nanoscale zero-valence iron injection, which have been put forward by the affected community. Work on the FS will continue after site characterization is complete and the groundwater model has been refined.

**Community Relations**—WSP is actively supporting EGLE's community outreach program by preparing quarterly newsletters for over 2,000 parties. Seventy-five percent of the newsletters are distributed via the Internet to minimize costs. WSP also developed graphic displays, slide presentations, and Fact Sheet packages to support EGLE with community and public groups outreach. An interactive webpage was developed for the project to present annual changes in the groundwater plume. EGLE has established a link to this page on its website as a tool for interested stakeholders.

### Wurtsmith Air Force Base

Key Personnel: Saamih Bashir, Justin Gal Project Address: Oscoda, Michigan Owner/Client Contract Contact Name and Telephone: COR Dan Medina; US Air Force; (210) 395-9451

#### **Relevance to Work Requested in RFP:**

- Environmental investigation
- Vapor Intrusion Assessment
- PFAS sampling
- Environmental/Roto sonic drilling
- PFAS Mitigation/Remediation/O&M
- Remediation System Design

**Overview** – WSP, under several contracts, was contracted to conduct several environmental investigations at the former Wurtsmith Air Force Base (AFB), including per- and Polyfluoroalkyl Substances (PFAS) investigation and sampling, private drinking water well sampling, and vapor intrusion (VI) assessment. The site occupied a 5,223-acres and is under various investigation and remediation for volatile organic compounds (VOCs) or petroleum compounds since 1984. WSP conducted a per- and polyfluoroalkyl substances (PFAS) preliminary assessment (Phase I) followed by a PFAS Phase II investigation between 2015 and 2019. Under a current contract, WSP is the technical lead for Wurtsmith on behalf of the prime LCES JV and is leading the groundwater Remedial Action-Operations (RA-O), long term monitoring (LTM), and Land Use Controls (LUC) for 25 Installation Restoration Program (IRP) Sites at the Former Wurtsmith AFB. The contract is funded annually



#### **Project Highlights:**

- Environmental investigation at two sites
- Vapor Intrusion Assessment at 25 sites
- PFAS investigation and sampling at 17 PFAS areas
- Residential drinking water sampling and PFAS mitigation
- PFAS remediation and
  Operation and Maintenance
- PFAS remedial design
- Public Meeting facilitation
  and support

and is valid through 2030. The scope of work includes the implementation of the full range of environmental, construction and optimization services necessary to conduct site restoration including maintenance of established remedies, landfill cap maintenance, implementation of optimization, and remediation activities to achieve performance objectives to include emerging requirements for environmental remediation as identified. Activities include collecting periodic, either quarterly, semiannually, or annual groundwater sampling for VOCs, metals and PFAS, tabulating groundwater data, and analyzing contaminant concentration trends using the Mann-Kendall model for optimization recommendations as well as conducting the annual base-wide groundwater gauging event and maintaining and updating the base groundwater model annually. Sampling data and model updates are documented in annual summary reports. WSP is responsible for conducting annual LUC inspections and summarizing this information in an annual LUC Report.

**Environmental Investigation**— WSP completed data gap investigation (DGI) at two sites within the former base in an effort to locate a tetrachloroethylene (PCE) source upgradient from monitoring well networks within those two areas. Activities included completing 20 vertical aquifer profiling (VAP) borings and collecting groundwater samples from four depth intervals.

**Vapor Intrusion Assessment**— WSP completed a Volatilization-to-Indoor Air Pathway (VIAP) Remedial Investigation (RI) at 25 sites within the former base to identify potential unacceptable VIAP risk associated with previous VOC impacts to soil, groundwater and/or soil-gas. Groundwater elevations, analytical data from long-term monitoring sampling events, historical soil, soil-gas, and groundwater analytical data from any available RI, Site Inspection (SI), and/or DGI were evaluated using Site-Specific Volatilization to Indoor Air Criteria (SSVIAC) provided by the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE). Four sites were further investigated due to the VOCs being present exceeding the screening criteria and posing potential human risk. Twenty-five (25) sub slab vapor pins and 17 soil-gas sampling points were installed and sampled quarterly for a year. **PFAS Investigation and sampling** – WSP completed PFAS site investigation at 17 aqueous film forming foam (AFFF) potential release areas. Up to 80 VAP locations were completed using sonic drilling and groundwater samples were collected from 4-5 intervals. Sonic drilling stopped as soon as confined (clay) layer was reached. During the PFAS investigation, soil, surface water and sediment samples were also collected.

**Residential Drinking Water Wells PFAS Sampling and Mitigation**– WSP also collected samples from over 60 residential private drinking water wells and two public drinking water supply wells. In the incident where the PFAS analytical results exceeded the applicable drinking water criteria, WSP immediately provided the residence with alternative drinking water supplies as an interim mitigation. WSP also coordinated and connected the residential house to the closest municipal water main line.

**PFAS sampling and Operation and Maintenance (O&M)** – Under the current contract, WSP is conducting O&M on three pump and treat ground water remediation systems (Mission, Central, and FT002) to treat PFAS within the former Wurtsmith AFB. Two of these systems (FT002 and the Central Treatment System) have recently been expanded to accommodate additional flow and treatment capacity. In addition, WSP is also responsible for O&M of one additional pump and treat groundwater remediation system (Engineered Wetlands Treatment System) to treat metals and two additional systems that operate sporadically (biosparge and air sparge). Activities include conducting daily system pressure and pumping capacity readings and collecting weekly/monthly system sampling, as well as troubleshooting and optimizing the treatment systems. Media changeouts of granular activated carbon and ion exchange resin, along with pump/well maintenance and sewer/conveyance line cleaning occur as needed. System operation and monitoring is documented in Monthly Technical Status Reports.

**PFAS Remediation System Design** – Under the new contract, WSP is designing a new pump and treat ground water remediation system (Alert Aircraft Area Interim Remedial Action) to treat PFAS within the former Wurtsmith AFB. System will include five (5) new extraction wells with three (3) granular activated carbon vessels as the primary treatment process. The new system will accommodate 500 gpm of flow and treatment capacity. The design also includes an expanded building footprint to accommodate future system capacity. WSP is currently preparing the 60% design package and construction is anticipated to commence in the Summer of 2023.

### 6 References

WSP is providing three references from clients, for similar projects completed within the last five (5) years.

Project #1	Project Name: Alpena Hide and Leather
Client Reference:	Janice Adams
Contact Information	P: 989-619-4211; email: adamsj1@michigan.gov
Year Completed:	Ongoing
Brief Summary:	WSP has worked with EGLE at this site to evaluate, delineate, and remediate comingled metals, cyanide, BTEX, and PFAS impacts at this site and develop Site-specific direct contact criteria for arsenic. In addition to standard remedial activities, WSP completed the first remedial pilot test of injectable biochar to immobilize PFAS (2108) and is in the process of pilot testing bioaugmentation and bioenhancement to degrade PFAS (including PFOS and PFOA).

Project #2	Project Name: 6598 Helen Street
Client Reference:	Beth Vens
Contact Information	P: 586-484-1030; email: vensb@michigan.gov
Year Completed:	Ongoing
Brief Summary:	This brownfield redevelopment project began as a remedial investigation (RI) of soil and groundwater at this former gas station. WSP conducted a regulated materials survey (RMS). The survey included asbestos, lead-based paint, and stained concrete sampling. Based on the results of the RI and RMS, WSP developed design bid specifications to demolish the building, remove the USTS, and excavate impacted soil. WSP assisted with Trade Contractor procurement and provided oversight of the construction activities
	consisting of UST removal, soil excavation and building demolition.

Project #3	Project Name: Broadway Coin Laundry
Client Reference:	Mary Miller
<b>Contact Information</b>	P: 517-898-6790; email: millerm61@michigan.gov
Year Completed:	Ongoing
Brief Summary:	Supporting brownfield redevelopment of this former dry cleaner property. Designed and implemented a series of geophysical profiles to define preferential migration pathways and focus remedial investigation. To assess GSI risk, contaminant fate and transport was assessed for possible migration into nearby water bodies. Vertical aquifer sampling (VAS) borings were advanced to varying depths of the groundwater system to characterize groundwater/soil. The CSM was updated to reflect a PCE groundwater plume with conditions suggesting a potentially complete VIAP and venting at GSI. WSP supported assessment and negotiations with downgradient property owners & consultants leading to VIAP assessments and installation of SSDSs. Conducted pilot testing using PlumeStop®

### Attachment A. Part II-2-A Position, Classification and Employee Billing Rate Information

#### POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION

#### **PROFESSIONAL SERVICES - 2023 ENVIRONMENTAL ISID**

#### Professional's Name WSP Engineering and Consulting of Michigan, Inc.

Yearly Percentage Billing Rate Increase

3%

Classifi cation	Employee(s) Name	Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027
P4	Saamih Bashir, PE**	Engineer	\$184.65	\$190.19	\$195.90	\$201.78	\$207.83
P4	Garret Bondy, PE**	Program Manager	\$250.00	\$257.50	\$265.22	\$273.18	\$281.37
P4	Emmet Curtis	Human Health Risk Assessor	\$172.55	\$177.72	\$183.06	\$188.55	\$194.20
P4	Rob Dewyre, CPG	Site Manager	\$216.33	\$222.82	\$229.51	\$236.39	\$243.48
P4	Steve Ellis, PhD	NRDA, Eco-Risk Assessor	\$244.27	\$251.59	\$259.14	\$266.92	\$274.92
P4	Bill Elzinga	Env. Impact Statements	\$249.68	\$257.17	\$264.88	\$272.83	\$281.01
P4	Jerry Eykholt, PhD, PE	Senior Engineer	\$208.43	\$214.69	\$221.13	\$227.76	\$234.59
P4	Sean Gormley**	Chemist	\$250.00	\$257.50	\$265.22	\$273.18	\$281.37
P4	Jeshua Hanson, PE**	Senior Engineer	\$210.27	\$216.57	\$223.07	\$229.76	\$236.66
P4	Jeff Lively, PE**	Senior Health Physicist	\$273.32	\$281.52	\$289.97	\$298.66	\$307.62
P4	Michael McGowan, PE**	Site Manager	\$166.29	\$171.28	\$176.41	\$181.71	\$187.16
P4	Wendi Michael, PMP, CHMM, PE	Site Manager	\$160.93	\$165.76	\$170.73	\$175.85	\$181.13
P4	Jay Mullett, PE	Site Manager	\$231.39	\$238.33	\$245.48	\$252.85	\$260.43
P4	Steve Murray, CPG**	Site Manager	\$183.29	\$188.79	\$194.45	\$200.28	\$206.29
P4	Peter Neithercut, PE	Site Manager	\$229.07	\$235.94	\$243.02	\$250.31	\$257.82
P4	Jeffrey Steiner, CPG	Sr Assoc Hydrogeologist	\$181.24	\$186.68	\$192.28	\$198.04	\$203.99
P4	Laura Stirban, PG	Site Manager	\$175.64	\$180.90	\$186.33	\$191.92	\$197.68
P4	Sandra Sroonian	Principal Scientist-Environmental	\$204.99	\$211.14	\$217.47	\$224.00	\$230.72
P4	Cindy Sundquist, CIH, CSP**	EH&S Manager	\$181.32	\$186.76	\$192.36	\$198.13	\$204.08
P4	Shalene Thomas**	Emerging Contaminants Program Manager	\$250.00	\$257.50	\$265.22	\$273.18	\$281.37
P4	Dave Woodward**	Principal Consultant	\$250.00	\$257.50	\$265.22	\$273.18	\$281.37

#### POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION

#### **PROFESSIONAL SERVICES - 2023 ENVIRONMENTAL ISID**

#### Professional's Name WSP Engineering and Consulting of Michigan, Inc.

3%

Yearly Percentage Billing Rate Increase

Classifi cation	Employee(s) Name	Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027
P3	Jason Armstrong, CPG**	Geologist	\$141.58	\$145.83	\$150.20	\$154.71	\$159.35
P3	Calkin, Scott	Geophysics	\$191.00	\$196.73	\$202.63	\$208.71	\$214.97
P3	Megan Cynar	Environmental Scientist	\$129.91	\$133.81	\$137.82	\$141.96	\$146.21
P3	Jeff Doerr, CPG	Geologist	\$103.53	\$106.64	\$109.84	\$113.13	\$116.53
P3	Anita Emery-DeVisser, CMNSP**	Site Manager	\$175.31	\$180.57	\$185.98	\$191.56	\$197.31
P3	Justin Gal, PE**	Engineer	\$187.80	\$193.43	\$199.24	\$205.21	\$211.37
P3	Jason Grahn**	Engineer	\$115.56	\$119.03	\$122.60	\$126.28	\$130.06
P3	Brian Hurry	Autocad 3D Drafter	\$137.97	\$142.11	\$146.37	\$150.77	\$155.29
P3	Deanna Hutsell, PE**	Engineer	\$146.09	\$150.47	\$154.99	\$159.64	\$164.43
P3	Nate Peck, EIT**	Environmental Engineer	\$126.88	\$130.68	\$134.60	\$138.64	\$142.80
P3	Leonard Mankowski, MS**	Geologist	\$167.57	\$172.60	\$177.78	\$183.11	\$188.60
P3	Chad Robinson, PE	Senior Engineer	\$163.06	\$167.95	\$172.99	\$178.18	\$183.53
P3	Nick Rogers**	Geologist	\$154.51	\$159.14	\$163.92	\$168.83	\$173.90
P3	Doug Saigh**	Hydrogeologist	\$136.41	\$140.51	\$144.72	\$149.06	\$153.54
P3	Elizabeth Stieber, PE	Engineer	\$173.86	\$179.07	\$184.45	\$189.98	\$195.68
P2	Ashlee Charters	Geologist	\$96.18	\$99.07	\$102.04	\$105.10	\$108.25
P2	Dylan Jones	GIS Specialist	\$80.41	\$82.82	\$85.31	\$87.87	\$90.50
P2	Chris Kapanowski	Chemistry/Lab QA/QC/Data Mgmt	\$116.08	\$119.56	\$123.15	\$126.84	\$130.65
P2	Zack McCurley	Geoscientist	\$115.07	\$118.52	\$122.08	\$125.74	\$129.51
P2	Kyle Noyce	Geologist	\$85.69	\$88.26	\$90.90	\$93.63	\$96.44
P2	Lindsay Selvig	Engineer	\$97.93	\$100.87	\$103.89	\$107.01	\$110.22
P2	Nicholas Weiss	Geologist	\$86.48	\$89.07	\$91.74	\$94.50	\$97.33

#### POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION

#### **PROFESSIONAL SERVICES - 2023 ENVIRONMENTAL ISID**

#### Professional's Name WSP Engineering and Consulting of Michigan, Inc.

3%

Yearly Percentage Billing Rate Increase

Classifi Employee(s) Name Position/Classification Year 2023 Year 2024 Year 2025 Year 2026 Year 2027 cation P1 Tarig Babiker Environmental Engineer \$87.13 \$89.75 \$92.44 \$95.21 \$98.07 P1 Lara Devine Geologist/Environmental Scientist \$77.08 \$79.39 \$81.77 \$84.22 \$86.75 P1 Ian Cisco \$79.74 Geologist \$75.16 \$77.42 \$82.13 \$84.60 P1 Benjamin Hockstad Geologist/Environmental Scientist \$78.91 \$81.27 \$83.71 \$86.22 \$88.81 P1 Benjamin McCarthy Geologist \$76.06 \$78.35 \$80.70 \$83.12 \$85.61 TS Bruce Cunningham Engineering Technician \$113.05 \$116.44 \$119.93 \$123.53 \$127.23 TS Peggy Franklin Sr. Subcontracts Administrator \$98.45 \$101.40 \$104.45 \$107.58 \$110.81 ΤS Paulette Denson Program Accountant \$91.26 \$94.00 \$96.82 \$99.72 \$102.72 Sarah Hitch TS Program Assistant \$91.59 \$94.34 \$97.17 \$100.08 \$103.08 ΤS Amy Rauser Administrative \$86.70 \$89.30 \$94.74 \$97.58 \$91.98 TS Lindsay Whitten Administrative \$112.53 \$115.90 \$119.38 \$122.96 \$126.65

\*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate Calculation," and the attached "Sample Standard Contract for Professional Services," Article II, Compensation Text.

\*\* Key Project Personnel

### Attachment B. Certification

Our signed Certification of a Michigan Based Business form is included in the following page.


# **Certification of a Michigan Based Business**

(Information Required Prior to Contract Award for Application of State Preference/Reciprocity Provisions)

To qualify as a Michigan business:

Vendor must have, during the 12 months immediately preceding this bid deadline: or

If the business is newly established, for the period the business has been in existence, it has:

(Check all that apply):

- X Filed a Michigan single business tax return showing a portion, or all the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL □<sup>2</sup>08.1 – 208.145: or
  - Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or

Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

X Bidder qualifies as a Michigan business (provide zip code: <u>48377</u>)

Bidder does not qualify as a Michigan business (provide name of State: \_\_\_\_\_).

Principal place of business is outside the State of Michigan, however service/commodity provided by a location within the State of Michigan (provide zip code: \_\_\_\_)



### DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET **State Facilities Administration Design & Construction Division**

Bidder: WSP Engineering and Consulting of Michigan, Inc.

Kendall H. Sherrill

Authorized Agent Name (print or type)

LUU H. XUU Authorized Agent Signature & Date

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN \$25,000 and subject to debarment under MCL 18.264.



# **Responsibility Certification**

The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

- (a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.
- (b) Has not had a felony conviction in any state (including the State of Michigan).
- (c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification, or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid rigging, or a violation of state or federal anti-trust statutes.
- (d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.
- (e) Has not been terminated for cause by the Owner.
- (f) Has not failed to pay any federal, state, or local taxes.
- (g) Has not failed to comply with all requirements for foreign corporations.
- (h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.
- (i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:
  - i. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
  - ii. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.



- iii. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the period required.
- iv. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).
- v. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.
- vi. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
- vii. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).
- (j) Is NOT an Iran linked business as defined in MCL 129.312.

### I understand that a false statement, misrepresentation, or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

Bidder: <u>WSP Engineering and Consulting of Michigan</u>, Inc.

Garret E. Bondy Authorized Agent Name (print or type)

···· 1/12/2023

Authorized Agent Signature & Date

I am unable to certify to the above statements. My explanation is attached.

# Attachment C: Acknowledgement of Addendums

PSC acknowledges receipt of Addenda: No. 1, dated December 7, 2022, No 2, dated December 21, 2022.

# Attachment D: Sample Field Activity Log and Weekly Report

CON	TRACTO	OR DAIL`	YAC	TIVITIE	S REF	PORT	
Project Title: Forbes Dry Location : Ypsilanti, Ml AMEC Project # 3293187	Cleaners On-S 7026	Site Excavation A	Activties			Date: Report No.:	12/17/2021 <u>21</u>
Shift: <u>Day</u>	Hours Worked	d: From:	<u>6:45</u>	To:	<u>16:50</u>		
Weather: <u>Sunny, E 5-</u>	15		Temp:	Low:	32	High:	40
PERSONNEL	COMPANY	TOTAL HO	URS	MAJOR EQ ONS	UIPMENT ITE	USED (y/n)	TOTAL HOURS
Dan Christman	AMEC	10.00		CAT 320 E	xcavator	У	7
Samantha Todaro	AMEC	10.00		CAT 345B L	Excavator	У	1
Jesse Johnson	TSP	9.25		Deere 544J F	ront Loader	У	1.5
Trevor Porter	TSP	7.00					
Rick	TSP	1.00					
Materials Delivered	EM	ND OF CONSTR		ACTIVITIES	semply		
Materials Delivered Material		Quantity	/				
NA		NA					
Delays, Interruptions, De	viations, Extra XCEPTIONS:	Work Activities,	Unusual	Occurrences	,etc., releva	ant to today's	work
Completed	bv <sup>.</sup>	Dan Christman		Title <sup>.</sup>	Tech Prof I	Date <sup>.</sup>	12/17/2021
Completed	~ ; .					Initials	Date
				Prepared by: Checked by:		DRC DLH	12/17/2021 2/2/2022

CON	TRACTO	OR DAILY AC	TIVITIE	S REF	PORT	
Project Title: Forbes Dry Location : Ypsilanti, MI AMEC Project # 3293187	Cleaners On-S 7026	Site Excavation Activties			Date: Report No.:	12/20/2021 <u>22</u>
Shift: <u>Day</u> Weather: <u>Cloudy, SW</u>	Hours Worke	d: From: <u>6:45</u> Temp:	To: Low:	<u>17:00</u> 29	High:	40
PERSONNEL	COMPANY	TOTAL HOURS	MAJOR EQ ONS		USED (y/n)	TOTAL HOURS
Dan Christman	AMEC	10.25	CAT 320 E	Excavator	у	8.5
Samantha Todaro	AMEC	10.25	CAT 345B L	Excavator	у	8.5
Jesse Johnson	TSP	9.00	Deere 544J F	ront Loader	У	1
Dave Reed	TSP	4.25				
Evan Velez	TSP	8.75				
DESCRIPTION OF WOR	RK PERFORM	ED TODAY:				
	E	ND OF CONSTRUCTION	I ACTIVITIES			
Materials Delivered		Quantity	T			
NA NA		NA	-			
Delays, Interruptions, De	viations, Extra	Work Activities, Unusua	I Occurrences	s,etc., releva	ant to today's	work
COMMENTS AND/OR E	XCEPTIONS:					
Completed	by:	Dan Christman	Title:	Tech Prof I	Date:	12/20/2021
			Prepared by:		Initials DRC	Date 12/20/2021
			Checked by:		DLH	2/2/2022

CON	TRACT	OR DAIL	YAC	TIVITIE	S REF	PORT	
Project Title: Forbes Dry Location : Ypsilanti, MI AMEC Project # 3293187	Cleaners On-S	ite Excavation	Activties			Date:	12/21/2021
	020					Report No	20
Shift: <u>Day</u>	Hours Worke	d: From:	<u>6:45</u>	To:	<u>17:30</u>		
Weather: <u>Cloudy, S 0</u>	-10		Temp:	Low:	29	High:	37
PERSONNEL	COMPANY	TOTAL HC	URS	MAJOR EQU ONSI	JIPMENT TE	USED (y/n)	TOTAL HOURS
Dan Christman	AMEC	10.75		CAT 320 E	xcavator	у	8
Samantha Todaro	AMEC	10.50		CAT 345B L	Excavator	У	8
Jesse Johnson	TSP	10.50		Deere 544J Fr	ont Loader	у	5
Evan Velez	TSP	9.50					
Dale Henderson	TSP	5.00					
DESCRIPTION OF WOR	K PERFORM	<u>-D TODAY:</u>					
Time		Descrip	tion of W	ork			
730 1000 850 1300		Delivery of Cla Excavation dev	ss II crusł vatering	ned limestone	sand		
935 1725		BAM relocation	from off-	site lot to Forb	oes Site		
	E	ID OF CONSTI	RUCTION	ACTIVITIES			
Materials Delivered		Quantit		ſ			
Class II Limeston	e Sand	96.13 To	.y ons				
				ļ			
Delays, Interruptions, De	viations, Extra	Work Activities	, Unusual	Occurrences,	etc., releva	ant to today's	work
Single driver sheduled to call from EGLE about BA	r work called o M being stored	ff, no other driv	ers availa	ible. No soil wa	as remove	d from site. I	SP received
	in being storet				alanopolit	olugo Di ini o	n olto.
COMMENTS AND/OR E	XCEPTIONS:						
Completed	by:	Dan Christman	l	Title: T	ech Prof I	Date:	12/21/2021
				<b>D</b>		Initials	Date
				Prepared by: Checked bv		DRC	12/21/2021 2/2/2022
				,,,		1	_, _, _ \ _ L

CON	TRACT	OR DAILY A	CTIVITI	ES REF	PORT	
Project Title: Forbes Dry Location : Ypsilanti, MI AMEC Project # 3293187	Cleaners On-S 7026	Site Excavation Activtie	es		Date: Report No.:	12/22/2021 <u>24</u>
Shift: <u>Day</u> Weather: <u>Cloudy, W</u>	Hours Worke	d: From: <u>6:40</u> Ten	To: np: Low	<u>17:40</u> : 23	High:	26
PERSONNEL	COMPANY	TOTAL HOURS	MAJOR E ON		USED (y/n)	TOTAL HOURS
Dan Christman	AMEC	11.00	CAT 320	Excavator	У	3
Samantha Todaro	AMEC	11.00	CAT 345B	L Excavator	У	8
Jesse Johnson	TSP	10.50	Deere 544J	Front Loader	У	1
Evan Velez	TSP	10.00				
Rick Pate	TSP	3.00				
DESCRIPTION OF WOR	RK PERFORM	ED TODAY:				
	Eł	ND OF CONSTRUCTI	ON ACTIVITIE	S		
Materials Delivered		Quantitu				
NA NA		NA				
			_			
Delays, Interruptions, De	viations, Extra	Work Activities, Unus	ual Occurrence	es,etc., releva	ant to today's	work
	<u>XCEPTIONS:</u>					
	<u>XCEPTIONS:</u>					
Completed	by:	Dan Christman	Title:	Tech Prof I	Date:	12/22/2021





Progress Meeting #8 Minutes Former Forbes Dry Cleaners On-Site Excavation Ypsilanti, MI



### EGLE Site ID – 81000622

Date/Time: December 23, 2021 – 10:00 AM EST

Location: Conference Call 1-866-670-1764 Participant Code: 219998346#

### Attendees:

Ashley Lesser Charles Spencer Nick Rogers Dan Christman Deanna Hutsell Mike McGowan

### Safety Moment -

Be prepared for inclement weather during holiday travel, as well as daily commute Continue safe work practices at site, truck spotting, etc.

### 1.1 Work Completed this Period (12/17/21 – 12/23/21)

• RCRA Listed Soil Excavation/Disposal continued

### 2.1 Work planned for next period (12/24/21 – 12/30/21)

- RCRA Listed Soil Excavation/Disposal
  - May utilize alternative trucking company to expedite process if delays continue
  - TSP to provide updated schedule

### 3.1 Project Construction Schedule – Based on 12/08/2021 schedule

- 10/20/2021 HASP, PEP, Waste Profile and Material Approvals
- **11/15/2021** Mobilization
- 11/17/2021 Concrete Demolition
- 11/29/2021 RCRA Listed Soil Excavation/Disposal
- 12/28/2022 Non-Hazardous Soil Excavation/Disposal
- 01/24/2022 Restoration
- 01/27/2022 Demobilization

### 4.1 Submittals/Shop Drawings

- CCO #0005
  - Additional backup needed from TSP (subcontractor quotes, hourly comps, etc.)
    - AMEC to forward example from last year with DTMB expectations for backup

Progress Meeting #8 Minutes 12-23-2021 Page 2

### 5.1 Request for Information (RFI)

•

### 6.1 Pending from Last Meeting

- MDOT Permit for temporary relocation of entrance off Ecorse Road
  - Addressed above

### 7.1 New Issues/Concerns

- EGLE
  - Stockpiled hotspot spoils
    - Preferable to remove spoils from site sooner than later, even if additional treatment is required
    - Awaiting word from landfill why waste cannot be treated on site; may require licensed treatment facility
    - TSP will provide adjusted cost for treatment, will overestimate yardage for safety, to avoid new cost basis
- TSP
  - Awaiting feedback on saturated clay removal plan
    - AMEC to revisit and respond
  - Awaiting update on CCO #0003 and CCO #0004, dumpster pickup and MDOT permit administrative effort
    - AMEC requests receipt for dumpster pickup, TSP to provide
    - EGLE takes no exception to admin hours for MDOT permit
    - TSP could combine admin and labor costs for MDOT permit costs and resubmit under one Field Order if preferred
      - No issues as long as Field Orders are approved before being billed
- AMEC –

ο

- Planned work for next week
  - TSP still working 12/28, 12/29 and 12/30
- Backfill stored outside fence line (west side of frac tank)
  - Though technically staged on Forbes property, best to avoid complications with tenant/owner
  - Stockpile has been moved, no more backfill will be staged in that area moving forward

### 8.1 Other Items

• 1120 Davis Access Agreement

### 9.1 Schedule Next Meeting

Thursday January 6<sup>th</sup> at 10:00 AM EST

	Total Forbe	Ta Summary Ma s Dry Cleane	ble 1 Iterial Tracking rs On-Site Exc	g Sh ava	neet ation				
PAY ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY		UNIT PRICE	TOTAL QUANTITY TO DATE	т	TOTAL COST O DATE	PERCENTAGE OF PROJECT QUANTITY TO DATE
1	Work Plan, Submittals, Permits	Lump Sum	1	\$	13,771.37	1	\$	13,771.37	100.00%
2	Mobilization	Lump Sum	1	\$	67,275.39	1	\$	67,275.39	100.00%
3	Soil Erosion and Sedimentation Controls	Lump Sum	1	\$	8,917.78	1	\$	8,917.78	100.00%
4	Surveying	Lump Sum	1	\$	7,861.13	0.3	\$	2,358.34	30.00%
5	Engineered excavation support/shoring	SF	6,000	\$	19.97	560.00	\$	11,183.20	9.33%
6	Excavation dewatering and water management	Lump Sum	1	\$	32,848.18	-	\$	-	0.00%
7	Surfactant VOC control	Day	15	\$	133.33	9	\$	1,200.01	60.00%
8	RCRA Hazardous Concrete Excavation, Transportation, and Disposal	Ton	100	\$	280.08	67.65	\$	18.947.41	67.65%
9	Concrete and Asphalt Excavation, Loading, Transportation, and Recycling	Ton	230	\$	22.22	119.14	\$	2,647.29	51.80%
10	RCRA hazardous soil excavation, loading, transportation, and disposal	Ton	2,200	\$	259.06	1,556.08	\$	403,118.08	70.73%
11	Non-hazardous soil excavation, loading, transportation, and disposal	Ton	8,600	\$	25.93	-	\$	-	0.00%
12	Provide and stage common fill	Ton	10,600	\$	13.17	674.19	\$	8,879.08	6.36%
13	Provide and stage BAM Soil Mixing Amendment	CY	120	\$	865.47	80.00	\$	69,237.60	66.67%
14	Soil mixing, backfill, and compaction with 5% BAM soil amendment, for saturated zone of excavation	CY	2,200	\$	13.27	169.30	\$	2,246.61	7.70%
15	Backfill and compaction of excavation above saturated zone	CY	4,500	\$	13.01	445.00	\$	5,789.45	9.89%
16	Provide, grade, and compact MDOT dense graded aggregate	Ton	1,000	\$	28.94	-	\$	-	0.00%
17	Hot Mix Asphalt Paving	SF	11,400	\$	5.07	-	\$	-	0.00%
18	Site Restoration	Lump Sum	1	\$	37,938.00	-	\$	-	0.00%
19	Cash Allowance	Lump Sum	1	\$	50,000.00	-	\$	-	0.00%
20	PROVISIONARY ALLOWANCE	Lump Sum	1	\$	100,000.00		\$	6,759.14	0.00%
						Total	\$ 6	622.330.76	

#### Alternate Costs

				TOTAL	
ITEM				QUANTITY TO	TOTAL COST
NO.	DESCRIPTION	UNITS	UNIT PRICE	DATE	TO DATE
	Work in level C PPE to accommodate VOC concentrations in				
1	the breathing zone	Day	\$ 1,500.00	-	\$-
	Work in level B PPE to accommodate VOC concentrations in				
2	the breathing zone	Day	\$ 3,000.00	-	\$-

	Table 2	
Pay Item 8: RCRA Hazardous Conc	rete Excavation, Transp	ortation, and Disposa
Forbes Dry Cle	aners On-Site Excavati	on
	1	

Date	Manifest Ticket Number	Manifest estimated weight (tons)	Dump Slip Number	Truck Number	Weight of Material (tons)	Landfill	Notes
11/22/21	19962944	20	B11122013	177	23.79	Envirosafe	
11/23/21	19962947	23	B11123007	177	26.14	Envirosafe	
11/23/21	19962942	23	B11123008	142	17.72	Envirosafe	
				TOTAL =	67.65	Tons	-

 Table 3

 Pay Item 9: Concrete and Asphalt Excavation, Loading, Transportation, and Recycling

 Forbes Dry Cleaners On-Site Excavation

	Dump Slip		Weight of Material	Landfill or Recycling	
Date	Number	Truck Number	(tons)	Facility	Notes
11/18/21	11802	993	46.02	Calo & Sons	
11/18/21	11803	993	41.81	Calo & Sons	
11/18/21	11804	993	31.31	Calo & Sons	
		TOTAL =	119.14	Tons	

Table 4
Pay Item 10: RCRA Hazardous Soil Excavation, Loading, Transportation, and Disposal
Forbes Dry Cleaners On-Site Excavation

	Manifest Ticket	Manifest estimated	Dump Slip		Weight of Material		
Date	Number	weight (tons)	Number	Truck Number	(tons)	Landfill	Notes
11/30/21	16493666	40	1359763	142	61.34	Wayne Disposal Inc.	S&C Transport ticket no. 10429
12/01/21	16493667	40	1359808	186	61.75	Wayne Disposal Inc.	S&C Transport ticket no. 16067
12/01/21	16493668	50	1359831	186	49.17	Wayne Disposal Inc.	S&C Transport ticket no. 16068
12/01/21	16493669	40	1359839	186	51.00	Wayne Disposal Inc.	S&C Transport ticket no. 16069
12/01/21	16493670	40	1359861	186	49.33	Wayne Disposal Inc.	S&C Transport ticket no. 16070
12/02/21	16493671	40	1359907	178	48.27	Wayne Disposal Inc.	S&C Transport ticket no. 15162
12/02/21	16493672	40	1359925	178	51.81	Wayne Disposal Inc.	S&C Transport ticket no. 15163
12/03/21	16493673	40	1359993	178	50.32	Wayne Disposal Inc.	S&C Transport ticket no. 15160
12/03/21	16493674	40	1360011	178	49.65	Wayne Disposal Inc.	S&C Transport ticket no. 15056
12/03/21	16493675	40	1360013	186	48.60	Wayne Disposal Inc.	S&C Transport ticket no. 16071
12/03/21	16493676	40	1360028	186	50.97	Wayne Disposal Inc.	S&C Transport ticket no. 16072
12/06/21	16493677	40	1360088	178	50.50	Wayne Disposal Inc.	S&C Transport ticket no. 15065
12/06/21	16493678	40	*	186	*	Wayne Disposal Inc.	S&C Transport ticket no. 16073
12/06/21	16493679	40	1360102	178	47.35	Wayne Disposal Inc.	S&C Transport ticket no. 15161
12/06/21	16493680	40	1360113	178	50.64	Wayne Disposal Inc.	S&C Transport, no ticket given
12/07/21	16493681	40	1360150	178	54.15	Wayne Disposal Inc.	S&C Transport ticket no. 15089
12/07/21	16493682	40	1360156	186	55.33	Wayne Disposal Inc.	S&C Transport ticket no. 16074
12/07/21	16493683	40	1360167	178	49.09	Wayne Disposal Inc.	S&C Transport ticket no. 15090
12/07/21	16493684	40	1360172	186	45.65	Wayne Disposal Inc.	S&C Transport ticket no. 16075
12/07/21	16493685	45	1360180	142	50.39	Wayne Disposal Inc.	S&C Transport ticket no. 16859
12/07/21	16493686	40	1360184	178	48.60	Wayne Disposal Inc.	S&C Transport ticket no. 15057
12/17/21	16493687	40	1360866	178	47.67	Wayne Disposal Inc.	S&C Transport ticket no. 15061
12/17/21	16493688	40	1360886	178	46.35	Wayne Disposal Inc.	S&C Transport ticket no. 15085
12/17/21	16493689	40	1360896	178	41.51	Wayne Disposal Inc.	S&C Transport ticket no. 15086
12/20/21	16493690	40	1360935	178	43.87	Wayne Disposal Inc.	S&C Transport ticket no. 15087
12/20/21	16493691	40	1360957	178	52.77	Wayne Disposal Inc.	S&C Transport ticket no. 15059
12/20/21	16493692	40	1360990	178	49.09	Wayne Disposal Inc.	S&C Transport ticket no. 15064
12/22/21	16493693	40	1361099	186	46.41	Wayne Disposal Inc.	S&C Transport ticket no. 16076
12/22/21	16493694	40	1361113	186	48.90	Wayne Disposal Inc.	S&C Transport ticket no. 16077
12/22/21	16493695	40	1361125	186	53.00	Wayne Disposal Inc.	S&C Transport ticket no. 16078
12/22/21	16493696	40	1361130	186	49.60	Wayne Disposal Inc.	S&C Transport ticket no. 16079
12/22/21	16493697	40	1361131	142	53.00	Wayne Disposal Inc.	S&C Transport ticket no. 10415
				TOTAL =	1,556.08	Tons	

Load rejected at landfill, returned to site

Table 5
Pay Item 11: Non-hazardous Soil Excavation, Loading, Transportation, and Disposal
Forbes Dry Cleaners Offsite Excavation

Date	Manifest Ticket Number	Manifest estimated weight (tons)	Dump Slip Number	Truck Number	Weight of Material (tons)	Landfill	Notes
				TOTAL =		Tons	

Table 6Pay Item 5: Engineered Excavation Support/ShoringForbes Dry Cleaners On-Site Excavation

Date	Area of Excavation Support	Notes
		Begin initial assembly of slide rail system in northwest corner of
11/29/21	-	hazardous excavation zone
		Continue initial assembly of slide rail system along northern half of
11/30/21	-	hazardous excavation zone
		Complete initial assembly of slide rail system in northeast corner of
12/01/21	400.00	hazardous excavation zone
12/21/21	160.00	Within first two trench boxes
TOTAL =	560.00	Square Feet

# Table 7 Pay Item 14: Soil Mixing, Backfill, and Compaction with 5% BAM Soil Amendment, for Saturated Zone of Excavation Forbes Dry Cleaners On-Site Excavation

	Estimated Volume of BAM used (cubic	Volume backfilled sand with BAM	BAM % of backfill	
Date	yards)	(cubic yards)	by volume	Notes
12/08/21	6	133.30	4.5%	Within slide rail system (20'x60'), 3' water table
12/21/21	2	40.00	5.0%	Within first two trench boxes (2 x 8'x16'), 3' water table
	TOTAL =	173.30	Cubic Ya	rds

Table 8
Pay Item 15: Backfill and Compaction of Excavation Above Saturated Zone
Forbes Dry Cleaners On-Site Excavation

	Volume of Backfill	
Date	(CY)	Notes
12/06/21	40	Used leftover Class II from Off-site remedial activities
12/07/21	80	Class II Limestone Sand
12/08/21	80	Water Main Spoils / Redford Clay
12/09/21	120	Water Main Spoils / Redford Clay
12/09/21	120	Class II Limestone Sand, above Redford Clay
12/20/21	120	Class II Limestone Sand, above Redford Clay
12/21/21	25	Class II Limestone Sand
12/22/21	60	Class II Limestone Sand
TOTAL =	445.00	Cubic Yards

Table 9
Pay Item 12: Provide and Stage Common Fill
Forbes Dry Cleaners On-Site Excavation

	Weigh Ticket			
Date	Number	Truck Number	Weight of Material (tons)	Notes
12/07/21	74110201	122	46.07	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 140378
12/07/21	74110210	122	46.47	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 140380
12/08/21	10187	122	48.79	Water Main Spoils, Michigan Crushed Concrete, Inc.
12/08/21	10190	122	46.54	Water Main Spoils, Michigan Crushed Concrete, Inc.
12/08/21	10192	122	51.53	Water Main Spoils, Michigan Crushed Concrete, Inc.
12/09/21	10197	122	45.74	Water Main Spoils, Michigan Crushed Concrete, Inc.
12/09/21	10198	122	44.08	Water Main Spoils, Michigan Crushed Concrete, Inc.
12/09/21	74110331	122	45.81	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 140381
12/09/21	74110347	122	45.65	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 140386
12/10/21	74110365	122	46.09	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 140388
12/10/21	74110371	110	49.74	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 137286
12/13/21	74110443	433	48.57	Crushed Limestone, Stoneco Dennison Pit #58-009, Jay's Excavating Ticket no. 15124
12/13/21	74110463	110	49.47	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 137290
12/13/21	74110475	433	49.63	Crushed Limestone, Stoneco Dennison Pit #58-009, Jay's Excavating Ticket no. 15125
12/13/21	74110476	110	50.32	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 137291
12/13/21	74110500	110	50.60	Crushed Limestone, Stoneco Dennison Pit #58-009, State Crushing Ticket no. 137292
12/13/21	74110501	433	49.64	Crushed Limestone, Stoneco Dennison Pit #58-009, Jay's Excavating Ticket no. 15126
12/21/21	74110956	433	48.05	Crushed Limestone, Stoneco Dennison Pit #58-009, Jay's Excavating Ticket no. 15139
12/21/21	74110975	433	48.08	Crushed Limestone, Stoneco Dennison Pit #58-009, Jay's Excavating Ticket no. 15140
		TOTAL =	674.19	Tons

#### Table 10 Pay Item 16: Provide, Grade, and Compact MDOT Dense Graded Aggregate Forbes Dry Cleaners On-Site Excavation

	Weigh Ticket		Weight of	
Date	Number	Truck Number	Material (tons)	Notes
		TOTAL =	0.00	Tons

Table 11	
Pay Item 7: Surfactant VOC Control	
Forbes Dry Cleaners On-Site Excavation	

Date	Notes		
12/1/2021	BioSolve applied to segregated spoils pile during work activities after exceedance, and over all disturbed soils		
12/1/2021	at conclusion of work activites		
12/2/2021	BioSolve applied over disturbed soils at conclusion of work activities		
12/3/2021	BioSolve applied over disturbed soils at conclusion of work activities		
12/6/2021	BioSolve applied over disturbed soils at conclusion of work activities		
12/7/2021	BioSolve applied over disturbed soils at conclusion of work activities		
12/9/2021	BioSolve applied to freshly removed slide rail panels after exceedance measured		
12/10/2021	BioSolve applied around segregated spoils pile at conclusion of work		
12/14/2021	BioSolve applied to slide rail system panels, posts and spreaders after removal from soil, prior to removal from		
12/14/2021	site		
12/15/2021	BioSolve applied to slide rail system panels, posts and spreaders prior to loading and removal from site		
TOTAL = 9	Days		

 Table 12

 Pay Item 13: Provide and Stage BAM Soil Mixing Amendment

 Forbes Dry Cleaners On-Site Excavation

Date	Load Ticket Number	Truck Number	Volume of Material (cubic yards)	Notes
12/02/21	155750	SL&C 726	40.00	BAM unloaded/stored at empty lot on Ecorse Rd
12/16/21	156408	SL&C 729	40.00	BAM unloaded/stored at empty lot on Ecorse Rd
		TOTAL =	80.00	Cubic Yards

#### Table 13 Pay Item 17: Hot Mix Asphalt Paving Forbes Dry Cleaners On-Site Excavation

Date	Area of Hot Mix Asphalt Paving	Notes
Total	-	

#### Table 14 Pay Item 20 : Provisionary Allowance Forbes Dry Cleaners On-Site Excavation

Date	Item Description	Quantity	Unit Cost	Total Cost	Comments
	Provisionary Allowance - Labor and equipment				
	necessary to locate, excavate and cover stockpiled				
	soil to eliminate volatilization and dust onto				
	neighboring properties.	1	\$4,051.78	\$4,051.78	
	Provisionary Allowance - Cost for sample collection				
	and laboratory analysis.	1	\$1,957.36	\$1,957.36	
	Provisionary Allowance - Cost for coordination with				
	waste disposal technical team for disposal				
	approvals	1	\$750.00	\$750.00	
		-	TOTALS =	\$ 6,759.14	

# **APPENDIX 3**

# **PROFESSIONAL CERTIFICATION**

# FORMS

(see pages 361 - 364)

# **APPENDIX 4**

### OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

### DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET, VEHICLE AND TRAVEL SERVICES SCHEDULE OF TRAVEL RATES FOR CLASSIFIED AND UNCLASSIFIED EMPLOYEES Effective January 1, 2023

### MICHIGAN SELECT CITIES\*

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	\$85.00	
Breakfast	\$11.75	\$14.75
Lunch	\$11.75	\$14.75
Dinner	\$28.00	\$31.00

### MICHIGAN IN-STATE ALL OTHER

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	\$85.00	
Breakfast	\$9.75	\$12.75
Lunch	\$9.75	\$12.75
Dinner	\$22.00	\$25.00
Lodging	\$51.00	
Breakfast	\$9.75	
Lunch	\$9.75	
Dinner	\$22.00	
Per Diem Total	\$92.50	

### **OUT-OF-STATE SELECT CITIES\***

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	Contact Conlin Travel	
Breakfast	\$15.00	\$18.00
Lunch	\$15.00	\$18.00
Dinner	\$29.00	\$32.00

### **OUT-OF-STATE ALL OTHER**

	Individual	Group Meeting (pre-arranged and approved)			
Lodging**	Contact Conlin Travel				
Breakfast	\$11.75	\$14.75			
Lunch	\$11.75	\$14.75			
Dinner	\$27.00	\$30.00			
Lodging	\$51.00				
Breakfast	\$11.75				
Lunch	\$11.75				
Dinner	\$27.00				
Per Diem Total	\$101.50				

Mileage Rates	Current
Premium Rate	\$0.655 per mile
Standard Rate	\$0.440 per mile

Incidental Costs Per Day (with overnight stay) \$5.00

\* See Select Cities Listing

\*\* Lodging available at State rate, or call Conlin Travel at 877-654-2179 or www.somtravel.com

## SELECT CITY LIST SCHEDULE OF TRAVEL RATES FOR CLASSIFIED AND UNCLASSIFIED EMPLOYEES Effective January 1, 2023

<b>Michigan Select Cit</b>	ies/Counties	
	CITIES	COUNTIES
	Ann Arbor, Auburn Hills, Beaver Island, Detroit, Grand Rapids, Holland, Leland, Mackinac Island, Petoskey, Pontiac, South Haven, Traverse City	Grand Traverse, Oakland, Wayne
<b>Out of State Select</b>	Cities/Counties	
STATE	CITIES	COUNTIES
Alaska	All locations	
Arizona	Phoenix, Scottsdale, Sedona	
California	Arcata, Edwards AFB, Eureka, Los Angeles, Mammoth Lakes, McKinleyville, Mill Valley, Monterey, Novato, Palm Springs, San Diego, San Francisco, San Rafael, Santa Barbara, Santa Monica, South Lake Tahoe, Truckee, Yosemite National Park	Los Angeles, Mendocino, Orange, Ventura
Colorado	Aspen, Breckenridge, Grand Lake, Silverthorne, Steamboat Springs, Telluride, Vail	
Connecticut	Bridgeport, Danbury	
District of Columbia	Washington DC (See also Maryland & Virginia)	
Florida	Boca Raton, Delray Beach, Fort Lauderdale, Jupiter, Key West, Miami	
Georgia	Brunswick, Jekyll Island	
Hawaii	All locations	
Idaho	Ketchum, Sun Valley	
Illinois	Chicago	Cook, Lake
Kentucky	Kenton	
Louisiana	New Orleans	
Maine	Bar Harbor, Kennebunk, Kittery, Rockport, Sandford	
Maryland	Baltimore City, Ocean City	Montgomery, Prince George
Massachusetts	Boston, Burlington, Cambridge, Martha's Vineyard, Woburn	Suffolk
Minnesota	Duluth, Minneapolis, St. Paul	Hennepin, Ramsey
Nevada	Las Vegas	
New Mexico	Santa Fe	
New York	Bronx, Brooklyn, Lake Placid, Manhattan, Melville, New Rochelle, Queens, Riverhead, Ronkonkoma, Staten Island, Tarrytown, White Plaines	Suffolk
Ohio	Cincinnati	
Pennsylvania	Pittsburgh	Bucks
Puerto Rico	All locations	
Rhode Island	Bristol, Jamestown, Middletown, Newport, Providence	Newport
Texas	Austin, Dallas, Houston, L.B. Johnson Space Center	
Utah	Park City	Summit
Vermont	Manchester, Montpelier, Stowe	Lamoille
Virginia	Alexandria, Fairfax, Falls Church	Arlington, Fairfax
Washington	Port Angeles, Port Townsend, Seattle	
Wyoming	Jackson, Pinedale	

# **APPENDIX 5**

# **CERTIFICATES OF INSURANCE**

ACORD	
ACORD	

# **CERTIFICATE OF LIABILITY INSURANCE**

DATE (MM/DD/YYYY) 3/14/2023

TH CE BE RE	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.											
IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).												
PROF		R	Conter rights to		0011		CONTAC		<u>,.</u>			
Arth	nur	J. Gallagher Risk	Management	Serv	ices,	LLC	NAME: PHONE	AJG Servio		FAX		
300	) Ma	adison Avenue	0				(A/C, No,	Ext): 212-994	4-7100	(A/C, No): 2	212-994	1-7047
28tl	h Fl	oor					ADDRES	s: GGB.WS	PUS.CERTR	EQUESTS@AJG.COM		
Nev	N Y	ork NY 10017					INSURER(S) AFFORDING COVERAGE NAIC #					
							INSURE	RA: Liberty Ir	nsurance Cor	poration		42404
INSU	RED					WSPGLOB-01	INSURE	кв: Zurich A	merican Insu	rance Company		16535
WS	PE	ngineering and C	onsulting of M	ichig	an Ir	1C.	INSURE	. America	n Guarantee	and Liability Ins Co		26247
468 Nov	50 /i 1	Nagellan Drive, S	suite 190				INCURE		Cuarantee			
NOV	/1, IX						NOUDER					
							INSURER					
001	/F D	4050	050	TIE12			INSUREF	RF:				
		AGES				NUMBER: 1078273928				REVISION NUMBER:		
INI CE EX	DIC/ ERTI	ATED. NOTWITHSTA FICATE MAY BE ISS JSIONS AND CONDIT	ANDING ANY RE SUED OR MAY F FIONS OF SUCH		EMEN AIN, CIES.	NT, TERM OR CONDITION THE INSURANCE AFFORDE LIMITS SHOWN MAY HAVE	OF ANY ED BY T BEEN R	CONTRACT	OR OTHER I S DESCRIBED PAID CLAIMS.	DOCUMENT WITH RESPECT DEREIN IS SUBJECT TO	D ALL T	VHICH THIS HE TERMS,
INSR LTR		TYPE OF INSUR	ANCE	ADDL INSD	SUBR WVD	POLICY NUMBER		POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMIT	s	
В	Х	COMMERCIAL GENERA		Y		GLO 9835819-09		5/1/2022	5/1/2023	EACH OCCURRENCE	\$ 3,500	000
		CLAIMS-MADE	X <sub>OCCUR</sub>							DAMAGE TO RENTED PREMISES (Faloccurrence)	\$ 100.0	00
										MED EXP (Any one person)	\$ 10.00	ງ ງ
											¢ 3 500	000
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ł	GEN		PPLIES PER:							GENERAL AGGREGATE	\$7,500	000
-	^	POLICY JECT	LOC							PRODUCTS - COMP/OP AGG	\$ 3,500	000
		OTHER:									\$	
A	AUT	OMOBILE LIABILITY		Y		AS7-621-094060-032		5/1/2022	5/1/2023	(Ea accident)	\$ 5,000	000
	Х	ANY AUTO								BODILY INJURY (Per person)	\$	
		OWNED AUTOS ONLY	SCHEDULED AUTOS							BODILY INJURY (Per accident)	\$	
ĺ		HIRED AUTOS ONLY	NON-OWNED							PROPERTY DAMAGE (Per accident)	\$	
ľ											\$	
С	Х	UMBRELLA LIAB				AUC0144386-06		5/1/2022	5/1/2023	EACH OCCURRENCE	\$2,000	000
ľ		EXCESS LIAB									\$ 2,000	000
Ī		DED X DETENTIO									\$2,000	
Δ	WOF		<u>♦ 10,000</u>		Y	WA7-62D-004060 012		5/1/2022	5/1/2022	X PER OTH-	φ	
Â	AND	EMPLOYERS' LIABILITY	Y/N		•	WA7-62D-094060-982		5/1/2022	5/1/2023	STATUTE   ER		000
à	OFF	CER/MEMBER EXCLUDE	D?	N / A		WA7-62D-095609-072 WC7-621-094060-912		5/1/2022 5/1/2022	5/1/2023 5/1/2023	E.L. EACH ACCIDENT	\$2,000	000
	(Mar	idatory in NH) s. describe under						02022	0/ 1/2020	E.L. DISEASE - EA EMPLOYEE	\$2,000	000
	DÉS	CRIPTION OF OPERATIC	NS below							E.L. DISEASE - POLICY LIMIT	\$2,000	000
0500		/01.05.0050.47/01/2 //		<b>FO</b> (4	00000							
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emp	oloye	ees, and agents are	included as Add	lition	al Ins	ured with respect to the Ge	eneral Li	ability and A	utomobile Lia	bility policies as required	by writte	en L'Automobilo
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Wor	kers	s Compensation / Er	mployers Liabilit	y poli	cies a	as required by written agree	ement, j	oursuant to a	and subject to	the policy's terms, definiti	ons, co	nditions and
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							SHOL	JLD ANY OF	THE ABOVE D	ESCRIBED POLICIES BE CA		ED BEFORE
							THE	EXPIRATION	N DATE THE	EREOF, NOTICE WILL E	BE DEL	IVERED IN
		The State of	Michigan its d	epar	tmen	its, divisions, agencies.	ACCO	ORDANCE WI	TH THE POLIC	Y PROVISIONS.		
		offices, comr	nissions, office	ers, e	emplo	oyees, and agents						
		530 West All	egan, 2nd Floo	or	-	-	AUTHOR	IZED REPRESE	NTATIVE			
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		1						© 19	88-2015 AC	ORD CORPORATION.	All riah	ts reserved.

Ą	CORD <sup>®</sup> (	ER	TIF	ICATE OF LIA	ABILITY INSURANCE					
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PRO	DUCER	10 11			CONTA		ro Toom			
Art	hur J. Gallagher Risk Managemer	t Ser	vices	, LLC	PHONE	212-98	1_2485	FAX	212-00	4-7047
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E)	XCLUSIONS AND CONDITIONS OF SUC	H POL	CIES.	LIMITS SHOWN MAY HAVE	BEENF	REDUCED BY	PAID CLAIMS.	D HEREIN IS SUBJECT IN	JALL	HE TERMS,
INSR LTR	TYPE OF INSURANCE	ADD	SUBR	POLICY NUMBER		POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMIT	s	
	COMMERCIAL GENERAL LIABILITY						• • • • •	EACH OCCURRENCE	\$	
	CLAIMS-MADE OCCUR							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$	
								MED EXP (Any one person)	\$	
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	GEN'L AGGREGATE LIMIT APPLIES PER:	-						GENERAL AGGREGATE	\$	
	POLICY PRO- JECT LOC							PRODUCTS - COMP/OP AGG	\$	
	OTHER:								\$	
	AUTOMOBILE LIABILITY							COMBINED SINGLE LIMIT (Ea accident)	\$	
	ANY AUTO							BODILY INJURY (Per person)	\$	
	OWNED SCHEDULED AUTOS							BODILY INJURY (Per accident)	\$	
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	AND EMPLOYERS' LIABILITY	4						STATUTE ER		
	OFFICER/MEMBER EXCLUDED?	N / A						E.L. EACH ACCIDENT	\$	
	If yes, describe under							E.L. DISEASE - EA EMPLOYEE	\$	
Α	Pollution Liability	Y		CPI 4846279-01		11/1/2022	11/1/2023	Per Claim/Aggregate	\$	0.000
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DESC	CRIPTION OF OPERATIONS / LOCATIONS / VEH	CLES (	ACORD	0 101, Additional Remarks Schedu	le, mav b	e attached if more	e space is require	ed)	1	
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em	ployees, and agents are included as A	dditior	mber nal Ins	sured with respect to the Po	ollution	Liability polici	es as require	d by written agreement, p	ursuan	t to and
sub	ject to the policy's terms, definitions, c	onditio	ons ar	nd exclusions.		51		, <u> </u>		
CEF	RTIFICATE HOLDER				CAN	CELLATION				
					SHC		THE ABOVE D	ESCRIBED POLICIES BE C		
	The State of Michigan its	dena	rtmer	nts divisions agencies		ORDANCE WI	TH THE POLIC	Y PROVISIONS.		
	offices, commissions, offi	cers,	empl	oyees, and agents						
	530 West Allegan, 2nd Fl	oor		-	AUTHO	RIZED REPRESE	NTATIVE			
	Lansing IVII 48933				Sa	2				
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ACORD <sup>®</sup> CERTIFICATE OF LIABILITY INSURANCE										DATE (MM/DD/YYYY) 3/14/2023				
T C B R	HIS ERT ELC EPR	CERTIFICATE TFICATE DOES OW. THIS CEP RESENTATIVE	IS I S NO RTIF OR F	SSUED AS A OT AFFIRMAT ICATE OF INS PRODUCER, A	MAT IVEL SURA ND T	TER Y OF NCE HE C	OF INFORMATION ONLY REGATIVELY AMEND, DOES NOT CONSTITU ERTIFICATE HOLDER.	( AND EXTE TE A (	CONFERS N ND OR ALTI CONTRACT I	io rights Er the co Between t	LUPON THE CERTIFICA VERAGE AFFORDED THE ISSUING INSUREF	TE HOI BY THE R(S), AU	LDER. THIS E POLICIES JTHORIZED	
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300	nur ) Ma	adison Avenue	risk e	wanagement	Serv	nces	, LLC	PHONE (A/C, N	o, Ext): 212-98	1-2485	FAX (A/C, No	: 212-99	94-7074	
281	h Fl							ADDRE	ss: GGB.WS	PUS.CertRed	quests@ajg.com		1	
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	lf ye DES	s, describe under SCRIPTION OF OPER	RATIC	NS below							E.L. DISEASE - POLICY LIMIT	\$		
A	Prof CLA	fessional Liability AIMS-MADE					QPL0022630		11/1/2022	10/31/2023	Per Claim Aggregate	\$1,00 \$3,00	00,000 00,000	
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	יידכ		EP					CAN						
CERTIFICATE HOLDER The State of Michigan its departments, divisions, agencies, offices, commissions, officers, employees, and agents						SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.								
		Lansing	MI 4	8933				$\subseteq$	22					
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### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

### **DESIGNATED INSURED - NONCONTRIBUTING**

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM GARAGE COVERAGE FORM MOTOR CARRIERS COVERAGE FORM TRUCKERS COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement identifies person(s) or organization(s) who are "insureds" under the Who Is An Insured Provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage form.

#### Schedule

#### Name of Person(s) or Organizations(s):

Any person or organization whom you have agreed in writing to add as an additional insured, but only to coverage and minimum limits of insurance required by the written agreement, and in no event to exceed either the scope of coverage or the limits of insurance provided in this policy.

#### **Regarding Designated Contract or Project:**

Each person or organization shown in the Schedule of this endorsement is an "insured" for Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured Provision contained in Section II of the Coverage Form.

#### The following is added to the **Other Insurance Condition:**

If you have agreed in a written agreement that this policy will be primary and without right of contribution from any insurance in force for an Additional Insured for liability arising out of your operations, and the agreement was executed prior to the "bodily injury" or "property damage", then this insurance will be primary and we will not seek contribution from such insurance.

### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

# WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US (WAIVER OF SUBROGATION)

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM BUSINESS AUTO COVERAGE FORM MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

#### SCHEDULE

#### Name(s) Of Person(s) Or Organization(s):

Any person or organization for whom you perform work under a written contract if the contract requires you to obtain this agreement from us, but only if the contract is executed prior to the injury or damage occurring.

Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The **Transfer Of Rights Of Recovery Against Others To Us** condition does not apply to the person(s) or organization(s) shown in the Schedule, but only to the extent that subrogation is waived prior to the "accident" or the "loss" under a contract with that person or organization.


### Waiver Of Subrogation (Blanket) Endorsement

Policy No.	Eff. Date of Pol.	Exp. Date of Pol.	Eff. Date of End.	Producer No.	Add'l. Prem	Return Prem.
GLO983581909	05/01/2022	05/01/2023	05/01/2022	93542000	INCL	INCL

### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

### **Commercial General Liability Coverage Part**

The following is added to the **Transfer Of Rights Of Recovery Against Others To Us Condition**:

If you are required by a written contract or agreement, which is executed before a loss, to waive your rights of recovery from others, we agree to waive our rights of recovery. This waiver of rights shall not be construed to be a waiver with respect to any other operations in which the insured has no contractual interest.



## Additional Insured – Automatic – Owners, Lessees Or Contractors

Policy No.	Eff. Date of Pol.	Exp. Date of Pol.	Eff. Date of End.	Producer No.	Add'l. Prem	Return Prem.
GLO9835819-09	05/01/2022	05/01/2023	05/01/2022	93542000	INCL	INCL

### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

Named Insured: See Attached Certificate

This endorsement modifies insurance provided under the:

**Commercial General Liability Coverage Part** 

- A. Section II Who Is An Insured is amended to include as an additional insured any person or organization whom you are required to add as an additional insured on this policy under a written contract or written agreement. Such person or organization is an additional insured only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:
  - 1. Your acts or omissions; or
  - 2. The acts or omissions of those acting on your behalf,

in the performance of your ongoing operations or "your work" as included in the "products-completed operations hazard", which is the subject of the written contract or written agreement.

However, the insurance afforded to such additional insured:

- 1. Only applies to the extent permitted by law; and
- 2. Will not be broader than that which you are required by the written contract or written agreement to provide for such additional insured.
- **B.** With respect to the insurance afforded to these additional insureds, the following additional exclusion applies:

This insurance does not apply to:

"Bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering of, or failure to render, any professional architectural, engineering or surveying services including:

- **a.** The preparing, approving or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or
- **b.** Supervisory, inspection, architectural or engineering activities.

This exclusion applies even if the claims against any insured allege negligence or other wrongdoing in the supervision, hiring, employment, training or monitoring of others by that insured, if the "occurrence" which caused the "bodily injury" or "property damage", or the offense which caused the "personal and advertising injury", involved the rendering of or the failure to render any professional architectural, engineering or surveying services.

## C. The following is added to Paragraph 2. Duties In The Event Of Occurrence, Offense, Claim Or Suit of Section IV – Commercial General Liability Conditions:

The additional insured must see to it that:

- 1. We are notified as soon as practicable of an "occurrence" or offense that may result in a claim;
- 2. We receive written notice of a claim or "suit" as soon as practicable; and
- 3. A request for defense and indemnity of the claim or "suit" will promptly be brought against any policy issued by another insurer under which the additional insured may be an insured in any capacity. This provision does not apply to insurance on which the additional insured is a Named Insured if the written contract or written agreement requires that this coverage be primary and non-contributory.
- **D.** For the purposes of the coverage provided by this endorsement:
  - 1. The following is added to the Other Insurance Condition of Section IV Commercial General Liability Conditions:

### Primary and Noncontributory insurance

This insurance is primary to and will not seek contribution from any other insurance available to an additional insured provided that:

- a. The additional insured is a Named Insured under such other insurance; and
- **b.** You are required by written contract or written agreement that this insurance be primary and not seek contribution from any other insurance available to the additional insured.
- 2. The following paragraph is added to Paragraph 4.b. of the Other Insurance Condition of Section IV Commercial General Liability Conditions:

This insurance is excess over:

Any of the other insurance, whether primary, excess, contingent or on any other basis, available to an additional insured, in which the additional insured on our policy is also covered as an additional insured on another policy providing coverage for the same "occurrence", offense, claim or "suit". This provision does not apply to any policy in which the additional insured is a Named Insured on such other policy and where our policy is required by a written contract or written agreement to provide coverage to the additional insured on a primary and non-contributory basis.

- **E.** This endorsement does not apply to an additional insured which has been added to this policy by an endorsement showing the additional insured in a Schedule of additional insureds, and which endorsement applies specifically to that identified additional insured.
- F. With respect to the insurance afforded to the additional insureds under this endorsement, the following is added to Section III Limits Of Insurance:

The most we will pay on behalf of the additional insured is the amount of insurance:

- 1. Required by the written contract or written agreement referenced in Paragraph A. of this endorsement; or
- 2. Available under the applicable Limits of Insurance shown in the Declarations,

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

All other terms and conditions of this policy remain unchanged.

# **Other Insurance Amendment – Primary And Non-Contributory**



Policy No.	Eff. Date of Pol.	Exp. Date of Pol.	Eff. Date of End.	Producer No.	Add'l. Prem	Return Prem.
GLO983581909	05/01/2022	05/01/2023	05/01/2022	93542000	INCL	INCL

### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

Named Insured: See Attached Certificate

This endorsement modifies insurance provided under the:

### **Commercial General Liability Coverage Part**

1. The following paragraph is added to the Other Insurance Condition of Section IV – Commercial General Liability Conditions:

This insurance is primary insurance to and will not seek contribution from any other insurance available to an additional insured under this policy provided that:

- a. The additional insured is a Named Insured under such other insurance; and
- **b.** You are required by a written contract or written agreement that this insurance would be primary and would not seek contribution from any any other insurance available to the additional insured.
- 2. The following paragraph is added to Paragraph 4.b. of the Other Insurance Condition of Section IV Commercial General Liability Conditions:

This insurance is excess over:

Any of the other insurance, whether primary, excess, contingent or on any other basis, available to an additional insured, in which the additional insured on our policy is also covered as an additional insured on another policy providing coverage for the same "occurrence", offense, claim or "suit". This provision does not apply to any policy in which the additional insured is a Named Insured on such other policy and where our policy is required by written contract or written agreement to provide coverage to the additional insured on a primary and non-contributory basis.

All other terms and conditions of this policy remain unchanged.

### **Workers Compensation**

### WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Not applicable in Kentucky, New Hampshire and New Jersey.

This waiver does not apply to any right to recover payments which the Minnesota Workers Compensation Reinsurance Association may have or pursue under M.S. 79.36

### Schedule

Any person or organization for which the employer has agreed by written contract, executed prior to loss, may execute a waiver of subrogation. However, for purposes of work performed by the employer in Missouri, this waiver of subrogation does not apply to any construction group of classifications as designated by the waiver of right to recover from others (subrogation) rule in our manual.

Where required by contract or written agreement prior to loss and allowed by law.

In the state of Connecticut, Florida, Maryland, Nebraska, Oregon the premium charge is 1 % of the total manual premium, subject to a minimum premium of \$250 per policy.

In the state of Hawaii, the premium charge is \$250 and determined as follows: The premium charge for this endorsement is 1 % of the total manual premium, subject to a minimum premium of \$250 per policy.

In the state of Louisiana, the premium charge is 2% of the total standard premium, subject to a minimum premium of \$250 per policy.

In the state of Massachusetts, the premium charge is 1 % of the total manual premium.

In the state of New York, the premium charge is 2% of the total manual premium, subject to a minimum premium of \$0 per policy.

In the state of North Carolina, the premium charge is 2% of the total manual premium, subject to a minimum premium of \$100 per policy.

In the state of Virginia, the premium charge is 5% of the total manual premium, subject to a minimum premium of \$250 per policy.

Issued by: Liberty Insurance Corporation 21814

For attachment to Policy No WA7-62D-094060-012

Effective: 5-1-22 to 5-1-23

Premium \$

Named Insured: See Attached Certificate