DOTD FORM: 24-102

(Revised June 1, 2021)

PROPOSAL TO PROVIDE CONSULTANT SERVICES

1.	Contract title as shown in the advertisement	**IDIQ CONTRACT FOR LOUISIANA WATERSHED INITATIVE/ STATE PROJECTS PROGRAM (LWI-SSP) – GROUP 1 BEAUREGARD, VERNON AND ST. LANDRY PARISHES**
2.	Contract number(s) as shown in the advertisement	**4400023101**
3.	State Project Number(s), if shown in the advertisement	**N/A**
4.	Prime consultant name (as registered with the Louisiana Secretary of State where such registration is required by law)	**MICHAEL BAKER INTERNATIONAL, INC.** Michael Baker INTERNATIONAL
5.	Prime consultant license number (as registered with the Louisiana Professional Engineering and Land Surveying Board (LAPELS) if registration is required under Louisiana law)	**E.F. 0000062** **V.F. 0000010**
6.	Prime consultant mailing address	**2600 CitiPlace Drive, Suite 450** **Baton Rouge, Louisiana 70808**
7.	Prime consultant physical address (existing or to be established, if location is used as an evaluation criteria)	
8.	Name, title, phone number, and email address of prime consultant's contract point of contact	**Jade Rung, PE** **Program Manager** **225-218-2840 | Jade.Rung@mbakerintl.com**
9.	Name, title, phone number, and email address of the official with signing authority for this proposal	**Daniel Thornhill, PE** **Office Manager - Associate Vice President** **225-218-2846 | Daniel.Thornhill@mbakerintl.com**
10.	This is to certify that all information contained herein is accurate and true, and that the team presently has sufficient staff to perform these services within the designated time frame. By submitting this proposal, proposer certifies that it is not engaged in a boycott of Israel and it will, for the duration of its contract obligations, refrain from a boycott of Israel. Proposer also certifies and agrees that the following information is correct: In preparing its response, the proposer has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not, in the solicitation, selection, or commercial treatment of any subcontractor or supplier, refused to transact or terminated business activities, or taken other actions intended to limit commercial relations, with a person or entity that is engaging in commercial transactions in Israel or Israeli-controlled territories, with the specific intent to accomplish a boycott or divestment of Israel. The proposer also has not retaliated against any person or other entity for reporting such refusal, termination, or commercially limiting actions. DOTD reserves the right to reject the response of the bidder or proposer if this certification is subsequently determined to be false, and to terminate any contract awarded based on such a false response.	**Signature (shall be the same person as #9):** **Date:**
11.	If a Disadvantaged Business Enterprise (DBE) goal has been set for this advertisement, indicate which firm(s) will be used to meet the DBE goal and each firm(s)' percentage.	**Firm(s):** **Firm(s)' %: Goal 0%**

12. PAST PERFORMANCE EVALUATION DISCIPLINE TABLE

"While Baker has always been a leader in dam safety and design, we have noticed over the past few years that your office has accomplished many outstanding dam design projects. Your dam designs have used sound design principles and state of the art dam procedures. Also, by using innovative design approaches, such as labyrinth weirs, rock anchors, and overtopping protection, your dam designs have had an economic benefit to your clients."
- Roger Adams, P.E., (Retired) Chief, PA Bureau of Waterways Engineering and Wetlands

Sub-consultants are allowed to be used for this proposal. Fill in the table by identifying only those evaluation disciplines consistent with the approach and methodology proposed in Section 18 of the DOTD Form 24-102*, the name of each firm that is part of the proposal, and the percentage of work in each past performance evaluation discipline to be performed by that firm. The percentage estimated for each evaluation discipline is for evaluation purposes only and will not control the actual performance or payment of the work. The percentages for the prime and sub-consultants must total 100% for each past performance evaluation discipline, as well as the overall total percent of the contract. (Add rows as needed)

Evaluation Discipline(s)	% of Overall Contract	Michael Baker	WSP	Forte & Tablada	Terracon
Other	70%	78.57%	21.43%	0%	0%
Survey	12.5%	4%	0%	96%	0%
Geotechnical	12.5%	20%	0%	0%	80%
Environmental	5%	80%	0%	0%	20%
		Identify the percentage of work for the overall contract to be performed by the prime consultant and each sub-consultant.			
PERCENT OF CONTRACT	100%	62%	15%	12%	11%

Prime consultant name: **Michael Baker International, Inc.**

13. FIRM SIZE

The Michael Baker team can successfully staff multiple, simultaneous Task Orders for this contract, even if the Task Orders are spread over a large geography. Our team has more than 23 dam and spillway rehabilitation evaluation and design experts, 250 H&H analysis staff, and 400 personnel throughout the Southeast that can be mobilized to serve DOTD on this contract.

Firm name	DOTD Job Classification	Number of personnel committed to this contract	Total number of personnel available in this DOTD Job Classification (if needed)
Michael Baker International, Inc. • Michael Baker is a leading provider of engineering and consulting services, including design, planning, architectural, environmental, construction and program management, and has been solving some of the world's most complex infrastructure challenges for over 80 years with a legacy of expertise, experience, innovation and integrity. • Trusted relationship with DOTD over the last 15 years, working on complex projects including numerical modeling, roadway and bridge design, Alternative Delivery and Construction Engineering and Inspection.	Administrative	1	2
	Biologist/Wetlands	2	4
	Clerical	1	2
	Engineer	2	2
	Engineer Intern	2	7
	Engineer - Other	1	17
	Environmental Pro	2	9
	Environmental Manager	1	4
	GIS Analyst	2	7
	Principal	1	5
	Senior Technician	2	12
	Supervisor - Eng	2	2
	Supervisor - Other	2	21
	Surveyor	1	0
	Technician	3	10
WSP USA, Inc. • WSP is an industry leader in performing comprehensive, state of the practice hydraulic and hydrologic analyses throughout the U.S. • WSP specializes in: Hydrologic Engineering (Probable maximum precipitation/probable maximum flood analysis and spillway design flood analysis) • Hydraulic Engineering (1D and 2D hydraulic modeling; 3D computational fluid dynamics modeling; dam hazard classification assessments; inspections and adequacy assessments for hydraulic structures; conceptual and detailed design and rehabilitation for dams, spillways and gates; and dam breach modeling) • Risk and Hazard Assessment (Dam breach analyses, inundation mapping and emergency action plans)	Administrative	2	10
	Designer	2	30
	Engineer	7	45
	Professional	7	35
	Senior Technician	5	20
	Principal	2	2
	Supervisor - Eng	5	15
	Technician	5	15

Firm name	DOTD Job Classification	Number of personnel committed to this contract	Total number of personnel available in this DOTD Job Classification (if needed)
Terracon Consultants, Inc. • Since 1985, Terracon has performed thousands of geotechnical investigations throughout LA. Their local office has several drill rigs and a fully equipped laboratory accredited by AASHTO and validated by the U.S. Army Corps of Engineers • Supported more than 70,700 environmental projects across 50 states in the past three years, and has a thorough understanding of local conditions and regulations and knows how to effectively manage the potential risks presented by hazardous materials and chemical releases that have impacted a site • Performs approximately 14,000 ESAs annually across the United States for both commercial and industrial clients. ESAs are performed in general accordance with accepted industry standards and American Society of Testing Materials (ASTM) guidelines	Principal	1	2
	Supervisor-ENG	1	4
	Engineer	1	3
	Engineer Intern	1	2
	Supervisor-Other (Drilling and Laboratory Manager)	2	3
	Technician (Lab and Field)	4	6
	Driller	2	5
Forte & Tablada, Inc. • Specializes in integration of traditional surveying, advanced technologies such as Multi-beam Echo sounding and LIDAR measurements, and other specialist engineering services • Able to properly equip and perform large-scale projects and accomplishing work quickly • Recently delivered several hydrographic survey projects throughout Louisiana, including the Amite River Basin survey, Belle Chasse Bridge and Tunnel Replacement, and Amite River Wier survey	Administrative	0	3
	CADD Technician	1	8
	Clerical	0	4
	Engineer	0	4
	Inspector	0	3
	Instrument Man	1	1
	Party Chief	2	6
	Engineer Intern	0	8
	Principal	1	3
	Rodman	2	11
	Senior Technician	2	3
	Supervisor Eng	0	4
	Supervisor Other	0	2
	Surveyor	3	5

14. ORGANIZATIONAL CHART

Underlined names indicated dicispline Task Lead

SUBCONSULTANT PARTNER FIRMS

WSP[1]
Forte & Tablada[2]
Terracon[3]

PRINCIPAL-IN-CHARGE
Daniel Thornhill, PE **MPR 1, 2**

PROJECT MANAGER
Jade Rung, PE, PMP **MPR 2**

DEPUTY PROJECT MANAGER
Jared Deible, PE **MPR 3**

QA/QC MANAGER
Steve Kramer, PE

TECHNICAL ADVISORS
Tom Smith, PE (FEMA Regulations, Dams)
Will Thomas, Jr., PH (Hydrology)

GEOTECHNICAL

(Design & Analysis)
Don Green, PE
Gang Zuo PhD, PE
John Lasko, PG

(Field Services & Testing)
Steve Greaber, PE[3]
Lynne Roussel, PE[3]
Matt Minton[3]
Brian Alexander[3]

HYDRAULICS & HYDROLOGY

Mohamed Bagha, PE, CFM, PMP **MPR 6a**
Yingjian "Jim" Han, PE, CFM **MPR 4**
Craig Wenger, PE, AICP, CFM **MPR 6b, c**
Sahas Shrestha, PE, CFM
Manoj KC, PhD, PE, CFM
Don Gregor, PE
Ahintha Kandamby, PhD. PE[1] **MPR 6b, c**
Tom Edwards, PE[1] **MPR 6b, c**

DAM ANLYSIS AND DESIGN

Jared Deible, PE **MPR 3**
Chris Tagert, PE, CFM **MPR 6d**
Mujahid Chandoo, PE
Joe Kudritz, PE
Brian Afek, PE
Ed Kaminski, PE
Jeff Barnard[1]

ENVIRONMENTAL

Christopher "Chris" Gesing, PE
TJ Holliday, PWS
Rachel Keane[3]
Rebecca Gaspard[3]

SUPPORT ROLES

SURVEY & MAPPING SUPPORT

Bradly "Brad" Holleman, PLS, EI[2] **MPR 5**
Stephen Clancy, PLS, PSM, GISP **MPR 5**
Ross Wilson, PLS[2] **MPR 5**
Brent Campbell[2]
Jace Ricard, PLS[2]
Spencer Rimes[2]

CONSTRUCTION INSPECTION SERVICES

Mary Flynn, PE
Jason Mashell, PE

QA/QC SUPPORT

Gregg Hudock, PE[1]

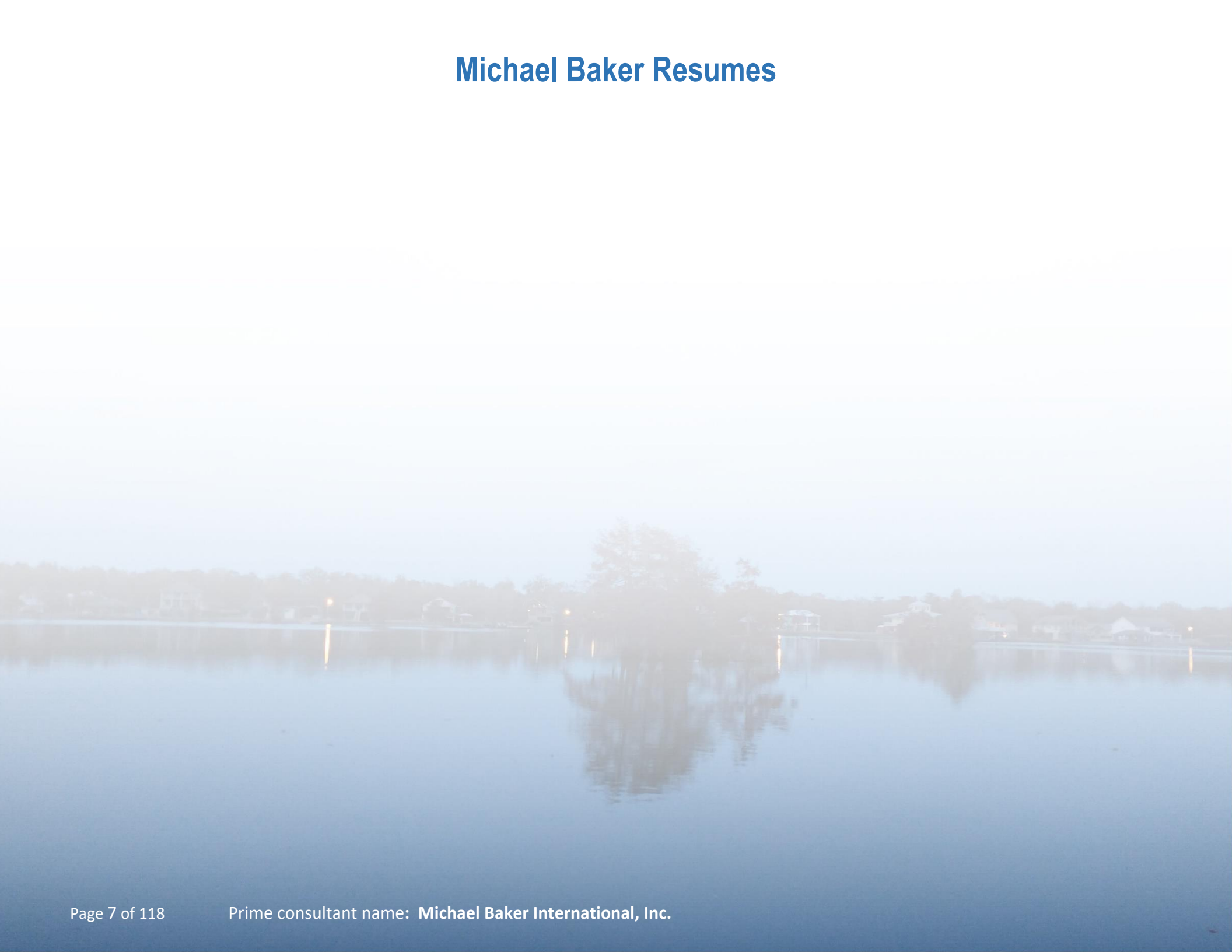
Prime consultant name: **Michael Baker International, Inc.**

15. MINIMUM PERSONNEL REQUIREMENTS

Michael Baker has assembled a team of both national and local experts, backed by a 'deep bench' of industry-leading dam rehabilitation evaluation professionals, dam design experts, and H&H analysis specialists. The Michael Baker team can not only meet DOTD's Minimum Personnel Requirements but provide depth and redundancy at key positions to ensure seamless service throughout this on-call contract.

MPR No. Do not insert wording from ad	Personnel being used to meet the MPR (Individual(s) may not satisfy more than one MPR unless specifically allowed by Attachment B of the advertisement)	Firm employed by	Type of license / certification & number	State of license	License / certification expiration date
1	Daniel Thornhill, PE	Michael Baker	Professional Engineer Registered in the State of Louisiana / 0032367	Louisiana	09/30/2022
2	Jade Rung, PE, PMP	Michael Baker	Professional Engineer Registered in the State of Louisiana / 0029081	Louisiana	09/15/2022
	Daniel Thornhill, PE	Michael Baker	Professional Engineer Registered in the State of Louisiana / 0032367		09/30/2022
3	Jared Deible, PE	Michael Baker	Professional Engineer Registered in the State of Louisiana / 0046098	Louisiana	03/31/2022
4	Yingjian "Jim" Han, PE	Michael Baker	Professional Engineer Registered in the State of Louisiana / 0035782	Louisiana	03/31/2023
5	Stephen Clancy, PLS, PSM, GISP	Michael Baker	Professional Engineer Registered in the State of Louisiana / 005059	Louisiana	03/31/2023
	Bradly "Brad" Holleman, PLS, EI	Forte & Tablada	Professional Land Surveyor Registered in the State of Louisiana / 005082	Louisiana	09/30/2022
	Ross Wilson, PLS		Professional Land Surveyor Registered in the State of Louisiana / 005148		03/31/2022
6	Mohamed Bagha, PE, CFM, PMP (6a)	Michael Baker	Professional Engineer Registered in the State of Texas / 102919	Texas	08/28/2023
	Craig Wenger, PE, AICP, CFM (6b, c)	Michael Baker	Professional Engineer Registered in the State of Delaware / 20944	Delaware	06/30/2022
	Ahintha Kandamby, PhD, PE (6b, c)	WSP	Professional Engineer Registered in the State of New York / 100685-1	New York	11/30/2023
	Tom Edwards, PE (6b, c)		Professional Engineer Registered in the State of New York / 098413	New York	12/31/2022
	Chris Tagert, PE, CFM (6d)	Michael Baker	Professional Engineer Registered in the State of Colorado / 38278	Colorado	10/31/2023

Michael Baker Resumes



16. STAFF EXPERIENCE

Michael Baker's proven team of engineers, scientists, and subconsultants from prior dam rehabilitations projects across the country will continue their service for these dam rehabilitations, providing invaluable experience. Since 1999, Michael Baker's Hydrology and Hydraulics (H&H) team has completed hundreds of flood risk identification, mitigation, and planning projects for Parishes, southeastern counties, cities, subsidence districts, river authorities, Federal Emergency Management Agency (FEMA), Departments of Transportation (DOTs), and U.S. Army Corps of Engineers (USACE).

Firm employed by **Michael Baker**			
Name	**Daniel Thornhill, PE**	Years of relevant experience with this employer	**1**
Title	Office Manager	Years of relevant experience with other employer(s)	**22**
Degree(s) / Years / Specialization		B.S. / 1997 / Civil Engineering, Louisiana State University and A & M College	
Active registration number / state / expiration date		32367 / Louisiana / 09/30/2022	
Year registered	2006	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 1 and 2. Project Principal**	

Mr. Thornhill has over two decades of consulting experience in a variety of engineering projects including roadway design, corridor/traffic operation concept analysis, bridge design, hydraulics design, subsurface drainage design, and sidewalk beautification projects. Before joining Michael Baker International, Mr. Thornhill has served as Project Manager/Senior Engineer in the Baton Rouge area since 2006 being responsible in charge for Roadway/Transportation Design and Corridor Studies for both EBR DOTD, DOTD, Lafayette Consolidated Government and St. Tammany Parish Department of Public Works.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
03/13 - 04/14, 08/14 - 01/16	**US 190 (Collins Blvd) Traffic Operations Study, Covington, (Stage 0) and Line & Grade Study for New Orleans Regional Planning Commission (Stage 1).** DOTD. Project Manager/Lead Design Engineer. Responsible for Roadway Geometrics during the Stage 0 for US 190 (Collins Blvd) from US 190 Business to US 190 (Ronald Reagan Blvd). The project widened US 190 (Collins Blvd) from an existing 2-lane roadway to a 4-lane boulevard to include the compete streets initiative of sidewalks, bike paths, and/or combination of both. DOTD wanted a traffic operations analysis done for this corridor as it is a major traffic route for commuters from north part of St. Tammany Parish to Covington, Mandeville, Slidell and to New Orleans via the Pontchartrain Causeway. Traffic analysis showed that a series of roundabouts in conjunction with J-turns and dual bridge crossing over the Bogue Falya would provide the best traffic movement. Stage 0 included using As-Built drawings along with Aerial photography to create Plan View Sketches that were included in a Stage 0 report along with project implementation cost. DOTD accepted the Stage 0 study. During coordination with stakeholders during the Stage 0, it was discovered that New Orleans Regional Planning Commission was already under contract for a Stage 1 Environmental Assessment (EA) for the same project corridor. Mr. Thornhill and his previous employer were then added to the Stage 1 team as a sub-consultant to perform the Line & Grade study to obtain Environmental Clearance. Recommendations from the Stage 0 Traffic Operations study was carried forward. Mr. Thornhill was Project Manager/Lead Design Engineer over the Line & Grade portion of the EA. He was responsible for the development of the Plan & Profile sketches for the Stage 1 report, development of project implementation cost, and creation of public meeting exhibits. For the Line & Grade, LiDAR was utilized with the Horizontal Alignments and Aerial Photography from the Stage 0 report. The updated sketches were used to develop the opinion of probable construction cost from the Line & Grade improvements along with developing estimated cost for relocation of utilities, acquisition of additional right-of-way, engineering cost (design & survey) and CE&I. A staging phase approach was required to break the project out in several phases to be design and constructed as funding became available. A priority matrix was created to determine the order in which the different phases should be constructed to provide the best Traffic Operation.
11/12 – 04/14	**LA 1088 Traffic Corridor Study, St. Tammany Parish, LA.** *DOTD.* Project Manager/Lead Designer. Responsible for the preparations for three Alternatives for the improvements of LA 1088 to increase traffic operation along the corridor. Each alternative included roundabouts and/or J-turns at strategic intersections along with sidewalks and/or combination of bike paths to meet DOTD complete streets initiative. Additional responsibilities included overseeing the development of the geometric layouts, determine required rights-of-way, developing Engineer's Opinion of Probable Construction Cost, and participation in Public Involvement Meetings for public input and comments. Mr. Thornhill attended meetings with local and state stakeholders to determine what needs each stakeholder wanted to see implemented during the feasibility study.

08/12 - 01/18	J**uban Road (LA 1026) Widening (I-12 to US 190), Livingston Parish, Louisiana.** Livingston Parish. Project Manager/Lead Design Engineer. Responsible for the development of construction plans for the widening of Juban Road from a 2-lane roadway to a 4-lane boulevard from just north of the I-12 Interchange to US 190. Improvements included three (3) multi-lane roundabouts along Juban Road while including sidepaths on both sides of Juban Road to meet the DOTD complete streets initiative. Access Management was a priority along this route therefore the median was reduced to 6' to 8' to discourage left turn movements and make all driveways right-in/right-out while utilizing the roundabouts for U-turn movements. The first roundabout was located at future driveway number 5 for the Juban Crossing Development. The second roundabout was located midway along project with addition of service roads to encourage Livingston Parish to extend during future development to reduce driveways along Juban Road. The third roundabout was located at the Juban Road at US 190 intersection. The roundabout would replace an existing signal that causes traffic congestion especially during peak afternoon traffic. Project included all necessary improvements along US 190 for the new roundabout and additional turn lane for the new Sanctuary Development. Mr. Thornhill responsibilities included coordination with DOTD project manager, all geometric design both horizontal and vertical, coordination of topographic surveys and development of right-of-way maps for acquisition, development of existing and design drainage maps, analysis of both subsurface and storm water drainage using DOTD's Hydraulics Manual and HYDRWin, development of construction plans for both preliminary and final design, and development of public meeting displays and coordination with DOTD environmental section for the update to the Environmental Document for environmental clearance. Additionally, he was responsible for separating the project construction plans into two separate construction plans (LA 1026 Roundabout at US 190 and LA 1026 Widening) for bidding due to need for air conformity permit for the improvements along Juban Road south of US 190 intersection. Recommendations from the Stage 0 Traffic Operations study was carried forward. Mr. Thornhill was Project Manager/Lead Design Engineer over the Line & Grade portion of the EA. He was responsible for the development of the Plan & Profile sketches for the Stage 1 report, development of project implementation cost, and creation of public meeting exhibits. For the Line & Grade, LiDAR was utilized with the Horizontal Alignments and Aerial Photography from the Stage 0 report. The updated sketches were used to develop the opinion of probable construction cost from the Line & Grade improvements along with developing estimated cost for relocation of utilities, acquisition of additional right-of-way, engineering cost (design & survey) and CE&I. A staging phase approach was required to break the project out in several phases to be design and constructed as funding became available. A priority matrix was created to determine the order in which the different phases should be constructed to provide the best Traffic Operation.
12/09 - 06/10	**Green Light Plan (GLP), East Baton Rouge Parish, Louisiana. East Baton Rouge Parish.** Project Manager. Responsible for the design and construction of 7 projects in East Baton Rouge Parish: Siegen Lane - Highland Road to Perkins Road (DOTD Roadway); Highland Road - Old Perkins Road to Airline Highway (DOTD Roadway) (Included new bridges and railroad coordination for at grade crossing); Jones Creek Road – Coursey Blvd to South Harrell's Ferry Road (Included new bridges); South Harrell's Ferry Road – Millerville Road to O'Neal Lane (Included new box culvert bridge); O'Neal Lane – South Harrell's Ferry Road to just south of I-12 (DOTD Roadway); and Lobdell Avenue – Government Street to Florida. Additional responsibilities included the preparation of bid documents, assisted DPW Field Engineering in construction progress meetings, distributed shop drawings and request for information for review and approval, made weekly site visits to projects to monitor the progress of the contractors, and assisted with in the field decisions in regards to adjustments due to utility conflicts or conflicts with the plans.
03/14 - 08/15	**I-12 Entrance Ramp at Millerville Road, East Baton Rouge Parish, Louisiana.** East Baton Rouge Parish. Project Manager/Engineer. Responsible for the design and construction of a new westbound entrance ramp from Millerville Road to I-12. Project included widening of Millerville Road to accommodate new double left turn lanes at new intersection at new development. Project included developing construction plans to meet DOTD and FHWA design guidelines and standards. Addition construction plan details involved development of traffic control plans for a lane shift of three (3) lanes along I-12 to provide protection for construction workers while the new entrance ramps were being constructed along with addition of new traffic signals and remove of an existing traffic signal. Project was issued a project permit through DOTD District 61. During the plan preparation and construction, Mr. Thornhill met with DOTD District 61 District Administrator and Construction Engineer to make sure all DOTD standards where being followed along with making sure the contractor was meeting all the requirements set forth by DOTD District 61 in the project permit.
02/20 - Current	**Pecue Lane / I-10 Interchange " FAP No.IM-1709(507), State Project No.700-17-0221 City Parish No.09-CS-US-0041.** *DOTD.* Project Manager. Since joining Michael Baker in February of 2020, served as the project manager handling all Request for Information (RFI) or Shop Drawings from the contractor. Project involved a 2-span bridge over I-10 for a new interchange that abutment earthwork was being supported by retaining walls. Project is currently under construction for Phase 2.

Firm employed by **Michael Baker**			
Name	**Jade Rung, PE, PMP**	Years of relevant experience with this employer	➲ **<1**
Title	Program Manager/Project Manager	Years of relevant experience with other employer(s)	➲ **>26**
Degree(s) / Years / Specialization		B.S.C.E. / 1995 / Civil Engineering - Structural, Louisiana State University	
Active registration number / state / expiration date		29081 / Professional Engineer, LA / 09/15/2022 1284298 / Project Management Professional (PMP) / Nationwide / 07/31/2024	
Year registered	2000 (PE) | 2009 (PMP)	Discipline	Civil/Structural
Contract role(s) / brief description of responsibilities		**MPR 2. Project Manager**	

Mr. Rung is a professional engineer experienced in all phases of delivery for multi-million-dollar capital projects. He has a proven history of domestic & international program/project management for commercial, municipal, industrial, marine, and heavy civil construction. He has substantial experience in the evaluation, planning, design, and construction management for the delivery of a major capital dam rehabilitation and improvement program, as well as extensive experience with Louisiana flood control and drainage/wastewater improvement programs. Mr. Rung has extensive communication and management skills to facilitate the project's scheduling, cost management, construction coordination, scope compliance, issues/change management, conflict resolution, standardized status reporting, and community outreach.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
06/10 – 08/11	**Ruskin Dam Rehabilitation, British Columbia Hydro Power, Vancouver, Canada –** provided program management and project controls for multi-phase evaluation and $900M rehabilitation of the generations Ruskin Dam facility including the structural seismic upgrades, turbine/generator replacement, and transmissions system for the facility. The capital improvement project greatly increases the safety and efficiency of the facility.; Project Manager/ the pre-project evaluation to verify return-on-investment (ROI) vs. decommissioning of the historic hydropower dam facility including environmental impacts associated with the deconstruction of the dam. Task included: coordinated internal project tasks and responsibilities; developed cost-loaded project schedule including maintenance and publication; facilitated internal and external project communications; coordinated all project scopes, schedules, funding, and budgets for accurate and timely reporting during all phases of the project.
01/14 – 03/16	**Hurricane and Storm Damage Risk Reduction System (HSDRRS), Mississippi River Levee (1.2A & 2.2) Flood Protection, New Orleans, LA.** *US Army Corps of Engineers*. Project Executive. Provided executive support for the project delivery team; local communications with State, Parish, and City officials; provide oversight for the general construction activities. Firm provided the hard structure construction of the new floodwall system for the Mississippi River levee flood protection system. Firm provided the driving steel sheet piles and steel pipe piles; pile load test; installation of a swing gate; construction of reinforced concrete floodwall, and other incidental work of the overall $83M project.
02/08 – 10/12	**Sewer System Evaluation and Rehabilitation Program, Sewerage and Water Board of New Orleans, New Orleans, LA.** *City of New Orleans*. Project Executive. Facilitated communications for the project between the internal project management team, City of New Orleans, project designer, and general contractor; provided updates on the progress and schedule look-ahead for the project progress. Firm provided the owner's representative services to manage and coordinate the delivery of the $160M sewer and drainage improvement program for the Sewerage & Water Board of New Orleans (SWBNO). The improvements as required by the US Environmental Protection Agency (EPA) and Louisiana Department of Environmental Quality (DEQ) were evaluated, designed, procured, construction managed, and documented by MWH for the SWBNO for verification.
02/08 – 06/10	**Infrastructure Rehabilitation Program, Office of Recovery and Development, New Orleans, LA.** *City of New Orleans*. Deputy Program Manager – Construction. Responsible for the design management, project coordination, project procurement, and construction management program; coordinate the City of New Orleans, architectural/engineering design firms, and general contractors for the recovery projects. Facilitated the approval for the first design-build projects for the City of New Orleans and the State of Louisiana. Following Hurricane Katrina, the firm was engaged to provide the program management services for the City of New Orleans Office of Recovery and Development Administration multi-facility, $1.5B dollar evaluation and rehabilitation program. Firm provided procurement and management for the facilitation of architectural/engineering design firms, and general contractors in the repair of approximately 300 city infrastructure projects. Firm also assisted the City of New Orleans in the procurement of FEMA, CDBG, and other funding sources to accommodate the projects. Included in the program included the development of the State of Louisiana's first design-build projects which required the legislature approval to provide the delivery of five new libraries using the "new" contract delivery method.
08/11 – 10/12	**Union Passenger Terminal to Canal Street Rail Expansion, Regional Transit Authority, New Orleans, LA.** *City of New Orleans*. Project Executive. Facilitated communications for the project between the internal project management team, City of New Orleans, project designer, and general contractor; provided updates on the progress and schedule

	look-ahead for the project progress. Firm teamed with WSP as lead program manager, provided the owner's representative services to manage and coordinate the delivery of the $15M streetcar rail improvements and expansion in the City of New Orleans for the Regional Transit Authority.
09/14 – 08/16	**O'Neal Lane Roadway Improvements, Baton Rouge, LA.** *East Baton Rouge Parish*. Project Executive. Provided executive support for the project delivery team; local communications with State, Parish, and City officials; provide oversight for the general construction activities. Firm provided the general contracting services for the $16M improvements to the O'Neal Lane in Baton Rouge, LA on the East Baton Rouge Parish Green Light Program. Improvements include bridge widening, roadway widening, utilities relocation, drainage improvements, and improved signal systems.
03/98 – 10/00	**Globalplex General Cargo Dock Expansion Project, Port of South Louisiana, Reserve, LA.** Project Manager. Managed the design, cost estimation, and construction delivery of all civil, marine, electrical, and mechanical phases; provided services for the preparation of the design, bid packages, contracts, and close-out documents for the marine work, electrical upgrade, dock expansion, electrical cranes, electrical gantries, and storage area; provided schedule, cost, and scope management including reporting which was required to be presented monthly to the Port of South Louisiana Board Commission. River Consulting Inc., (RCI) provided the design & construction management for the $29M Cargo Dock Expansion project at the Port of South Louisiana. The project included expansion of the existing finger pier dock into a 204 feet by 660 feet deep-draft general cargo dock to handle breakbulk & general cargo. The dock was equipped with two full-electric Manitowoc 2250 rail-mounted gantry cranes (with spreaders) to travel the full-length of the dock. The project also included a 177,000 square feet storage pad and the necessary electrical improvements to facilitate the new electric gantry cranes, electrical services, and site lighting.
10/00 – 09/02	**625 St. Charles Condominiums, Bauer Development Co., New Orleans, LA.** Project Manager. Provided contract negotiation and management of all subcontractors for every trade on the project; provided estimating, negotiating, contracting, and construction of the residences within the property; provided leadership to the eleven project engineers and field staff during construction; prepared weekly evaluations and monthly reports for presentation to the Gibbs senior management and property owners; provided public relations on the project including press conferences and condominium association meetings. Gibbs Construction Co., provided the construction of the $28M 625 St. Charles Condominiums Project. This luxury condominium development is located across from Lafayette Square in downtown New Orleans. It has 39 residential units with an indoor parking garage, 24-hour security, a full gym facility, lap pool, conference room and reception rooms. The building is centrally located on the streetcar line and steps away from restaurants, hotels, wine bars and other attractions such as museums and art galleries.
03/07 – 02/08	**New Agriculture Center Office, Louisiana State University, Hammond, LA.** General Contractor. Provided permitting, subcontracting, scheduling, coordination and close-out for the delivery of a new commercial office space for the research station. Rung & Associates, LLC provided the general contracting services for the delivery of the $510k new office facility for the LSU Ag Center Hammond Research Station.

Firm employed by **Michael Baker**			
Name	**Steve Kramer, PE**	Years of relevant experience with this employer	➲ **36**
Title	Technical Manager	Years of relevant experience with other employer(s)	➲ **1**
Degree(s) / Years / Specialization		B.S. / 1985 / Civil Engineering, University of Pittsburgh	
Active registration number / state / expiration date		PE039885E / Pennsylvania / 09/30/2023	
Year registered	1990	Discipline	Civil
Contract role(s) / brief description of responsibilities		**QA/QC Manager**	

Mr. Kramer will serve as Quality Control Lead and will be responsible for reviewing all deliverables prior to submission and for providing senior-level technical guidance throughout the project. Mr. Kramer's 35 years of Civil Engineering experience has been focused on the evaluation and design of water resources projects. Mr. Kramer has served as Quality Control Manager for dam rehabilitation projects for the PFBC, (Pennsylvania Department of Conservation and Natural Resources) PADCNR, and the Ohio Department of Natural Resources and a number of Virginia and West Virginia dams. Mr. Kramer's extensive experience in design and construction on dams and water resources projects enables him to provide insightful and construction-related comments during the quality control process.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
01/09 – 07/12	**Canonsburg Lake, Chapman Lake, Dutch Fork Lake, Donegal Lake, Kyle Lake, and Somerset Lake Rehabilitation, PA.** *Pennsylvania Department of Conservation and Natural Resources and Pennsylvania Fish and Boat Commission*. Quality Control Lead. Responsible for QA/QC review of all deliverables including design reports, design alternatives, construction drawings, specifications, cost estimates and regulatory permits. Mr. Kramer oversaw the design and analysis of all components of the design including the replacement spillways, RCC and ACB overtopping protection, control tower rehabilitation, lake drain extensions, and water control and phasing plans. Mr. Kramer has also provided construction oversight and guidance during the construction of the dams.
12/14 – 08/17	**Lake Loramie Dam Rehabilitation, OH.** *Ohio Department of Natural Resources*. Quality Control Lead. Responsible for QA/QC review of all deliverables including hydrologic and hydraulic reports, design alternatives, construction drawings, specifications, cost estimates and regulatory permits. Provided senior level technical guidance on key components of the design such as geometry of the spillway and water control measures. Lake Loramie was required to be maintained at normal pool throughout construction. Mr. Kramer oversaw the development of phasing and water control plans to ensure public safety throughout construction.
10/15 – 06/17	**Mount Gilead Lake Upper and Lower Dam Rehabilitation, OH.** *Ohio Department of Natural Resources*. Quality Control Lead. Responsible for QA/QC review of all deliverables. Mr. Kramer reviewed the geotechnical and hydrologic and hydraulic analyses included in the preliminary design report, spillway design alternatives, construction drawings, specifications, cost estimates and regulatory permits. Mr. Kramer oversaw the design and analysis of the labyrinth spillway, the first of this type to be designed and to be constructed in Ohio, to ensure that the spillway conformed to published guidance documents. Mr. Kramer met onsite with the contractor multiple times to help develop a successful water control plan that met the client's and contractor's need.
02/02 – 12/07	**Geotechnical Open-End Services, Allegheny County, PA.** *Allegheny County Department of Public Works.* Technical Manager. Responsible for drainage, stormwater, and hydrologic designs for various projects. Projects ranged from roadway drainage design to complex flood studies. Tasks included rehabilitation of dams, dam inspections, environmental permitting, and watershed stormwater modeling. Michael Baker was retained by the County in 2002 to provide on-call Geotechnical support to address Geotechnical impacts to the County's aging infrastructure. Geotechnical services provided under this contract included emergency response, landslide remediation, addressing lateral support issues, retaining wall failures, drainage improvements, flood facility studies, dam inspections, dam rehabilitation, roadway subgrade evaluations, subsurface investigations, laboratory testing and construction support.
01/09 – 05/12	**Dutch Fork Lake Dam Condition Assessment and Rehabilitation Design, Donegal Township, Washington County, PA.** *Pennsylvania Fish and Boat Commission.* Technical Manager. Responsible for obtaining local and federal permits including, Erosion and Sediment Control, National Pollutant Discharge Elimination System, dam permit, and wetland permitting. Michael Baker provided engineering services for rehabilitation of the Dutch Fork Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PBFC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Dutch Fork Lake Dam was constructed in 1959 and creates Dutch Fork Lake, which was a heavily used recreational facility until PFBC breached the dam in 2005 after damage to the spillway occurred during Hurricane Ivan. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing hydrologic and hydraulic analyses; performing topographical surveys and geotechnical investigations to evaluate current conditions; identifying and analyzing rehabilitation alternatives; developing designs; and providing construction management services.

06/11 – 01/16	**Dam Rehabilitations, Scioto, Pike, and Vinton Counties, OH.** *Ohio Department of Natural Resources.* Task Manager. Mr. Kramer is Michael Baker's in-house permitting expert and oversees development of a variety of permits including; Application for a Dam Permit, Letter of Authorization for Dam Improvements, Joint 404, Erosion and Sedimentation Control, NPDES, Chapter 105, as well as GP4 and other general permits. Michael Baker is providing engineering services for the rehabilitation of several dams to bring them into compliance with current state safety regulations. Michael Baker's services include dam inspection, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection.
01/09 – 12/21 (Estimated)	**Rehabilitation of Kyle Lake Dam, Washington Township, PA.** *Pennsylvania Fish and Boat Commission.* Technical Manager. Responsible for obtaining local and federal permits including, Erosion and Sediment Control, National Pollutant Discharge Elimination System, dam permit, and wetland permitting. Michael Baker provided engineering services for the Kyle Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PBFC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Kyle Lake Dam, located in Jefferson County, Pennsylvania, was constructed in 1910 and creates Kyle Lake, a heavily used recreational facility. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic analysis; performing a topographical survey, geotechnical investigation, and structural analysis to evaluate current conditions; identifying and analyzing rehabilitation alternatives; and providing construction management services.
02/09 – 01/22 (Estimated)	**Rehabilitation of Donegal Lake Dam, Donegal Township, PA.** *Pennsylvania Fish and Boat Commission.* Technical Manager. Responsible for obtaining local and federal permits including, Erosion and Sediment Control, National Pollutant Discharge Elimination System, dam permit, and wetland permitting. Michael Baker provided engineering services for rehabilitation of the Donegal Lake Dam to ensure compliance with Pennsylvania Department of Environmental Protection regulations for spillway capacity and overtopping protection during the design event. Donegal Lake Dam, located in Westmoreland County, Pennsylvania, is owned by the Pennsylvania Fish and Boat Commission. The dam was constructed in 1967 and creates Donegal Lake, which is a heavily used recreational facility. Michael Baker's tasks included reviewing existing drawings and reports; performing a field assessment, hydrologic and hydraulic analysis, topographical survey, and subsurface investigation to evaluate the current condition of the dam; identifying and screening alternatives and developing remediation designs and cost estimates; and providing construction oversight.
01/09 – 12/25 (Estimated)	**Rehabilitation of Five Pennsylvania Dams, Various Locations, PA.** *Pennsylvania Fish & Boat Commission.* Quality Control Lead. Responsible for QA/QC review of all deliverables including design reports, design alternatives, construction drawings, specifications, cost estimates and regulatory permits. Mr. Kramer oversaw the design and analysis of all components of the design including the replacement spillways, RCC and ACB overtopping protection, control tower rehabilitation, lake drain extensions, and water control and phasing plans. Mr. Kramer will also assist with construction oversight and guidance during the construction of the dams.

Firm employed by **Michael Baker**			
Name	**Jared Deible, PE**	Years of relevant experience with this employer	➲ **5**
Title	Regional Dams Lead	Years of relevant experience with other employer(s)	➲ **11**
Degree(s) / Years / Specialization		M.S. / 2005 / Civil and Environmental Engineering, Carnegie Mellon University B.S. / 2005 / Civil Engineering, Carnegie Mellon University	
Active registration number / state / expiration date		PE077488 / Pennsylvania / 10/2023 0046098 / Louisiana / 03/31/2022	
Year registered	2010 (PA) | 2021 (LA)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 3. Deputy Project Manager. Dam Analysis and Design Lead**	

Jared Deible will serve as the Dam Safety/Design Lead and will be responsible for supporting dam assessment and technical design aspects of the project. Mr. Deible has over 15 years of experience in dam assessment, design, and construction including embankment dams, spillway improvements, concrete dam assessment and repair, RCC overtopping protection and RCC dam construction, and seepage and stability improvements. He has supported a wide range of dam projects including detailed inspections, Potential Failure Modes Analysis (PFMA) and Semi-Quantitative Risk Assessment (SQRA), detailed design of modifications, and construction support.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
06/21 - Current	**New Jersey Department of Environmental Protection Enhanced Dam Risk Assessment Program.** *NJDEP*. Technical Lead. Responsible for developing risk screening methodology, evaluating potential failure modes, and assigning screening level risk ratings. Program includes 37 high hazard dams rated in poor condition across New Jersey, and results are being used to prioritize repairs and funding under FEMA's HHPD Program.
12/16 – Current	**PFBC Dam Rehabilitations, PA.** *Pennsylvania Fish and Boat Commission*. Project Manager/Senior Engineer. Project Manager for two dam rehabilitations, and assisting with technical aspects of other projects. Projects involve addressing inadequate spillway capacity, replacing or repairing deteriorated concrete structures, and improving embankment stability and drainage for ten high hazard dams. Responsible for supporting dams during construction including assisting with construction issues, reviewing submittals and RFIs, and construction inspection for RCC and other tasks.
03/21 – 11/21	**Taum Sauk Part 12 Inspection and PFMA, Ironton, Missouri.** *Ameren Missouri*. Project Manager and Part 12 Inspector. Performed Part 12 inspection for the Taum Sauk Hydroelectric Project, a pumped storage project consisting of an Upper Reservoir, Lower Reservoir, Powerhouse, and Outlet Works. Performed inspection, led Potential Failure Modes Analysis (PFMA) review session, and prepared Part 12 Inspection Report and PFMA Update Report.
01/17 - Current	**PADCNR Dam Safety Projects, Various Locations, PA.** *Pennsylvania Department of Conservation and Natural Resources*. Senior Engineer. Performed inspections for several projects including Raccoon Creek Dam, Little Buffalo Run Dam, and Pymatuning Dam. Reviewing analysis and design for various tasks including design of seepage filters and toe berms, subsurface investigations, and spillway repairs.
12/16 – Current	**ODNR Dam Rehabilitations, Ohio.** *Ohio Department of Natural Resources*. Senior Engineer. Assisting with technical aspects of projects including site inspection and characterization, dam assessment and design, and construction administration. Projects involve addressing inadequate spillway capacity, replacing or repairing deteriorated concrete structures, and improving embankment stability and drainage for ten high hazard dams.
10/18 – Current	**Wheeling Creek Structure 25 Rehabilitation, Wheeling, West Virginia.** *Natural Resources Conservation Service*. Project manager, overseeing evaluation, design, and analysis for dam rehabilitation to meet high hazard criteria including addressing inadequate spillway capacity, seepage and stability deficiencies, and outlet works modifications. Overseeing geotechnical investigation and preparing design drawings, technical specifications, and supporting calculations.

Firm employed by **Michael Baker**			
Name	**Wilbert "Will" Thomas, Jr., PH**	Years of relevant experience with this employer	➲ **24**
Title	Senior Technical Consultant	Years of relevant experience with other employer(s)	➲ **30**
Degree(s) / Years / Specialization		M.S. / 1972 / Statistics, University of Illinois B.S. / 1965 / Mathematics, University of Maryland	
Active registration number / state / expiration date		Professional Hydrologist 92-H-974 / Nationwide / 01/14/2022	
Year registered	1992	Discipline	Civil / Surface Water Hydrology
Contract role(s) / brief description of responsibilities		**Technical Advisor (Hydrology)**	

Mr. Thomas has specialized experience in conducting water resources projects and analyzing water resources data. Mr. Thomas is an Emeritus Member of the Transportation Research Board committee on Hydrology, Hydraulics and Water Quality (AFB60) and chaired a National Cooperative Highway Research Program (NCHRP) Panel on joint probability of flooding at confluent streams. Mr. Thomas is now an Emeritus Member of the TRB Committee on Hydrology, Hydraulics and Water Quality (AFB60). Mr. Thomas represents the Association of State Floodplain Managers (ASFPM) on the Subcommittee on Hydrology (SOH) under the Interagency Advisory Committee on Water Information and currently chairs the Hydrologic Frequency Analysis Work Group of the SOH. He was a member of the Federal Interagency Hydrology Subcommittee that developed Bulletin 17B "Guidelines for Determining Flood Flow Frequency." He trains Michael Baker, FEMA, USACE, and others in statistical hydrology and its application to the NFIP, and previously spent 30 years as a hydrologist with USGS.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
03/95 – 05/19	**Technical Support for FEMA**. *FEMA*. Mr. Thomas has provided technical support to FEMA for several Michael Baker contracts (1995-2019) with the tasks including: review of hydrologic studies for Flood Insurance Studies (FISs) and Letters of Map Revision (LOMRs), resolution of appeals of FISs and LOMRs, participation on technical committees like the 2006 Galloway Committee on levees, coordination and development of technical guidance such as "Appendix C: Guidance for Riverine Flooding Analyses and Mapping" (November 2009). In recent years, Mr. Thomas has provided as-needed hydrologic advice on complex Letters of Map Amendments (LOMAs) and comments on CERC outreach reports and documents.
01/77 – 03/82	**Development of National Flood Frequency Guidelines**. *U.S. Geological Study*. As a USGS employee, Mr. Thomas was a member of the Federal Interagency Work Group that developed the national flood frequency guidelines for gauge analysis "Guidelines for Determining Flood Flow Frequency", Bulletin 17B (March 1982).
11/06 – 03/18	**Update of National Flood Frequency Guidelines**. *FEMA*. Mr. Thomas was Chair of the Hydrologic Frequency Analysis Work Group that developed the updated national flood frequency "Guidelines for Determining Flood Flow Frequency", Bulletin 17C and is a co-author of the USGS report (England *et al.,* 2018).
01/04 – 05/19	**Technical Support for Flood Insurance Studies performed by Michael Baker.** *Various State Governments.* Mr. Thomas performed flood frequency analyses at riverine gauging stations using Bulletin 17B or 17C for many FEMA flood insurance studies in several states including but not limited to Virginia, Tennessee, Minnesota, Texas, Montana, Nevada and Nebraska. For studies in Nevada, Virginia and Nebraska, Mr. Thomas developed regional regression equations for estimating the needed flood discharges (e.g., 1-percent chance discharge) for ungauged watersheds.
12/07 – 12/08	**Tide Gauge Analyses for FEMA**. *FEMA*. Mr. Thomas performed at site and regional L-moment tide gauge analyses for many tide gauges along the Atlanta and Gulf Open Coast and New England Coastline (reports dated December 2008). Performed tide gauge analyses for several tide gauges along the Mississippi and Louisiana coasts for flooding during Hurricanes Katrina and Rita in August 2005 and Superstorm Sandy in October 2012 along the Delaware to Connecticut coastlines and documented these analyses in reports to FEMA.
07/14 – 06/16	**Development of FHWA Hydraulic Engineering Circular (HEC) No. 17**. *FHWA*. Mr. Thomas was a member of a research team that developed HEC-17 on "Highways in the River Environment – Floodplains, Extreme Events, Risk, and Resilience" (June 2016) that provides technical guidance and methods for assessing the vulnerability of transportation facilities to extreme events and climate change in the riverine environment. As part of this effort, Mr. Thomas summarized studies of trends in historical flood discharges and extreme precipitation and documented a method for flood frequency analysis for nonstationary data at gauging stations.
10/16 – 03/19	**National Research Report for the Transportation Research Board (TRB).** *TRB.* Mr. Thomas was part of a research team that developed two reports on "Applying Climate Change Information to Hydrologic and Coastal Design of Transportation Infrastructure". The reports were submitted to TRB in March 2019 but have not been published yet. As part of this effort, Mr. Thomas documented a method for flood frequency analysis for nonstationary data at gauging stations that could be used to project flood discharges in the future based on land use change.

06/96 – 05/19	**Technical Support for the Maryland State Highway Administration (MSHA).** Mr. Thomas has provided technical support to MSHA and the Maryland Department of the Environment for many years first as a member of the Maryland Hydrology Panel and as Chair of the Hydrology Panel since August 2006. The Hydrology Panel has produced four editions of "Application of Hydrologic Methods in Maryland" that describes an approach for calibration of the TR-20 hydrologic model using flood estimates from gauging stations and regression equations. As part of this effort, Mr. Thomas developed regional regression equations for estimating flood discharges (e.g., 1-percent chance discharge) for hydrologic regions in Maryland in 2006, 2010, 2015 with a current analysis underway.

Firm employed by **Michael Baker**			
Name	**Thomas Smith, PE**	Years of relevant experience with this employer	➲ **46**
Title	Civil Engineering/Levees	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		B.S.C.E., / 1973 / Civil Engineering, Pennsylvania State University	
Active registration number / state / expiration date		0402017462 / Virginia / 07/31/2023	
Year registered	1979	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Technical Advisor (FEMA Regulations, Dams)**	

Mr. Smith is a civil engineer whose experience includes a wide range of projects involving watershed mapping, dams and levees, municipal works, and floodplain, drainage, and channel studies. He provides technical advice, quality control, and supervision to project staff. For the past 8 years, Mr. Smith has worked with FEMA's Levee Analysis and Mapping Procedures (LAMP). The LAMP development started in Feb 2011 with receipt of letters from Congress asking FEMA to develop better standards for analyzing non-accredited levees. Mr. Smith led a team that developed the new guidance published in the Approach Document (Analysis and Mapping Procedures for Non-Accredited Levee Systems, New Approach, July 2013) and Operating Guidance (Operating Guidance 12-13 Non-Accredited Levee Analysis and Mapping Guidance, September 2013). Mr. Smith helped write and update the documents that have been incorporated into the updated guidance document for levees (Guidance for Flood Risk Analysis and Mapping, Levees, February 2019).

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
01/18-01/19	**Community Engagement and Risk Communication, Nationwide.** *FEMA.* Subject Matter Expert. Responsible for providing outreach and technical support to FEMA headquarters SMEs related to **levees and dams** and MT-2 (map revision) requests. Support includes attendance/participation at meetings with FEMA and USACE and others; historical background on FEMA processes and regulations; and technical solutions and approaches related to guidance and FEMA's new **levee analysis and mapping procedures**. Also assist the CERC correspondence support group related to special responses and congressional inquiries received by FEMA. Provide support to the CERC Regional Offices supporting all FEMA Regions including attendance/participation in **Local Levee Partnership Meetings** and development of outreach and messaging for these meetings.
08/13-05/19	**Santa Clara River Levee (SCR-3), Ventura County, California.** *Ventura County Watershed Protection Dist.* Technical Advisor. Provided technical support on project. Michael Baker provided final engineering design services for the Santa Clara River **Levee** (SCR-3) for a two-mile reach downstream of Highway 101. The project goal is to correct these deficiencies and close the "gap" in the **levee system**.
07/13-12/19	**Master Service Agreement for Huntington Levee Project, Fairfax County, Virginia.** *Department of Public Works and Environmental Services.* Technical Manager. Provided lead technical review and analyses related to the Huntington **Levee** Project. Michael Baker provided flood mitigation, interior drainage analysis, **levee** design support, public outreach planning, and permitting tasks for a **levee** and pump station design in the flood prone Huntington area of Fairfax County for the Department of Public Works and Environmental Services.
07/01-05/08	**Tropical Storm Allison Recovery Project, Harris County, Texas.** *FEMA, Region VI.* Hydraulic Engineer. Responsible for attending coordination/review meetings and providing hydrologic, hydraulic, and mapping technical expertise and review of the NFIP mapping products. Michael Baker assisted FEMA and the Harris County Flood Control District in accurately redefining flood hazards in Harris County, Texas in its first major update of FIRMs in nearly 30 years.
11/10-01/14	**National Flood Insurance and Risk MAP Project, Nationwide.** *FEMA.* Engineering Manager. Lead a team of engineering specialists in providing technical and programmatic support to Michael Baker project staff and FEMA staff related to the National Flood Insurance Program. Activities included providing technical advice and support, updating guidelines and specifications, training of both Michael Baker staff and FEMA staff, and answering technical questions to communities, consultants, and local citizens.
10/04-09/14	**Regional Task Orders for the Flood Map Modernization Program, Nationwide.** *FEMA.* QA/QC Engineer. Provided technical support and QA/QC reviews for hydrologic, hydraulic, and floodplain mapping related to preparation of FIS Reports, DFIRMs, and DFIRM databases for the NFIP. Michael Baker is performing various tasks leading to the development of digital flood insurance rate maps (DFIRM) and supporting the Map Modernization program in all 10 FEMA Regions.
08/11-01/18	**Boulder Creek Flood Map Update, Boulder, Colorado.** *FEMA.* Technical Specialist. Provided technical and quality review of hydrologic/hydraulic analyses and also provided technical assistance to project staff. Michael Baker provided floodplain mapping services for seven miles of Boulder Creek through the city and an additional seven miles of split flow reaches through downtown streets and agricultural ditches.

Firm employed by **Michael Baker**			
Name	**Don Green, PE**	Years of relevant experience with this employer	➲ **15**
Title	Geotechnical Specialist	Years of relevant experience with other employer(s)	➲ **28**
Degree(s) / Years / Specialization		M.S. / 2004 / Civil Engineering / University of Pittsburgh B.S. / 1978 /Civil Engineering / University of Pittsburgh	
Active registration number / state / expiration date		PE#034330E / Pennsylvania / 09/30/2023	
Year registered	1985	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Analysis Lead)**	

Mr. Green will serve as the Geotechnical Lead and will be responsible for the geotechnical investigation and design at each of the projects. Mr. Green is a Geotechnical Engineer with more than 35 years of geotechnical consulting experience in dam inspection and design, geotechnical and environmental engineering, planning, laboratory and field investigation, engineering analysis and design, plans and specifications preparation, and project supervision and management. He has spent the majority of his career working with dams across the nation. Mr. Green has implemented geotechnical investigations for a number of concrete and earthen embankment dams belonging to PFBC and Pennsylvania Department Conservation and Natural Resources. Mr. Green has been responsible for evaluating the stability of concrete gravity and earthen embankment dams and is an expert in designing soil and rock post-tensioned anchor systems that meet state dam safety regulations.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
10/18 – 09/20	**Rehabilitation of Donegal Lake Dam; Donegal Township, PA.** *Pennsylvania Department of General Services*. Geotechnical Lead. Responsible for completing a geotechnical investigation and provided design recommendations for collection of seepage and other drainage improvements, replacement of spillway slabs, extension of outlet conduit, and roller compacted concrete embankment overtopping protection. Michael Baker provided engineering services for rehabilitation of the Donegal Lake Dam to ensure compliance with Pennsylvania Department of Environmental Protection regulations for spillway capacity and overtopping protection during the design event. Donegal Lake Dam, located in Westmoreland County, Pennsylvania, is owned by the Pennsylvania Fish and Boat Commission. The dam was constructed in 1967 and creates Donegal Lake, which is a heavily used recreational facility. Michael Baker's tasks included reviewing existing drawings and reports; performing a field assessment, hydrologic and hydraulic analysis, topographical survey, and subsurface investigation to evaluate the current condition of the dam; identifying and screening alternatives and developing remediation designs and cost estimates; and providing construction oversight.
01/21 – 12/25 (Estimated)	**PFBC Dam Rehabilitations, PA.** *Pennsylvania Fish and Boat Commission*. Geotechnical Lead. Responsible for completing a geotechnical investigation and providing design recommendations for collection of seepage and other drainage improvements, replacement of spillways, and stability of embankments. Michael Baker is providing engineering services for five dam rehabilitations, owned by the Pennsylvania Fish and Boat Commission, to ensure compliance with Pennsylvania Department of Environmental Protection regulations. Michael Baker's tasks include reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic analysis; performing a topographical survey, geotechnical investigation, and structural analysis identifying and analyzing rehabilitation alternatives; and providing construction management services.
02/09 – 01/12	**Dutch Fork Lake Dam Condition Assessment and Rehabilitation Design; Donegal Township, Washington County, PA.** *Pennsylvania Department of General Services*. Geotechnical Engineer. Responsible for completing a geotechnical investigation and provided design recommendations for collection of seepage and other drainage improvements, replacement of spillway, extension of outlet conduit, and roller compacted concrete embankment overtopping protection. Michael Baker provided engineering services for rehabilitation of the Dutch Fork Lake Dam, owned by the Pennsylvania Fish and Boat Commission, to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Dutch Fork Lake Dam was constructed in 1959 and creates Dutch Fork Lake, which was a heavily used recreational facility until PFBC breached the dam in 2005 after damage to the spillway occurred during Hurricane Ivan. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing hydrologic and hydraulic analyses; performing topographical surveys and geotechnical investigations to evaluate current conditions; identifying and analyzing rehabilitation alternatives; developing designs; and providing construction management services.
03/09 – 02/12	**Rehabilitation of the Canonsburg Lake Dam; Peters and North Strabane Townships, PA.** *Pennsylvania Fish & Boat Commission*. Geotechnical Engineer. Responsible for design of passive dowels and high capacity post-tensioned anchors to improve overturning and sliding resistance for an existing concrete gravity dam. Also responsible for structural design of a composite wall to alleviate distress at the right training wall. Assisted in the development of complex hydrologic and hydraulic calculations, geotechnical investigation, and structural analysis for the dam. Worked with PADGS, PFBC, and PADEP to determine the best approach to be advanced to final design.

06/15 – 01/18	**Lake Loramie Dam Rehabilitation, OH.** *Ohio Department of Natural Resources*. Geotechnical Lead. Responsible for conducting a subsurface exploration plan and geotechnical analysis of the existing and new embankment section to be constructed through the existing stream channel. Mr. Green provided construction drawings for the new zoned embankment, graded filter, and seepage collection and monitoring system. A sheet pile system was also designed through the new embankment to reduce the seepage through the embankment. Mr. Green developed conceptual phasing plans and sketches that utilized the existing spillway convey normal flows while maintaining normal pool throughout construction. Mr. Green also met with the contractor and ODNR to help develop a stable and effective cofferdam to allow the lake to remain at normal pool throughout construction.
01/13 – 02/13	**Chapman Dam Rehabilitation; Pleasant Township, PA.** *Pennsylvania Department of General Services*. Geotechnical Lead. Responsible for completing a geotechnical investigation and providing design recommendations for spillway replacement, retaining walls, drainage collection, drainage monitoring, and grout curtains. Michael Baker is performing analyses, providing permitting services, and developing designs and will perform construction administration for the rehabilitation of the Chapman Dam, located on the West Branch of Tionesta Creek, within Chapman State Park. Michael Baker is responsible for designing the renovations of the existing spillway and outlet works, addressing stability and seepage concerns with the embankment, and evaluating the dam's compliance with PADEP regulations regarding overtopping protection during the design event.

Firm employed by **Michael Baker**			
Name	**John Lasko, PG**	Years of relevant experience with this employer	➲ **32**
Title	Senior Geologist	Years of relevant experience with other employer(s)	➲ **2**
Degree(s) / Years / Specialization		M.S. / 1989 / Earth Science and Geology, California University of Pennsylvania B.S. / 1985 / Geology, Juniata College	
Active registration number / state / expiration date		PG001420G / Professional Geologist, Pennsylvania / 09/30/2023	
Year registered	1995	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Analysis Support)**	

Mr. Lasko's background encompasses a variety of geotechnical projects. His experience includes project task management, test boring layout, drilling inspection, geotechnical interpretation of subsurface geology, construction inspection and related project field work.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
12/18 -05/22 (Estimated)	**Knox Dam Improvements, OH.** *Ohio Department of Natural Resources.* Senior Geologist. Responsible for site reconnaissance, drilling supervision, oversight, coordination, selection of laboratory testing, review of logged materials, and subsurface interpretation of findings. Conducted a literature review to determine soil, geologic, and hydrologic setting and ground water conditions for the existing dam. Assessed landslide susceptibility at the dam based on published literature and aerial photographs review. Determined dam borrow source and evaluate landslide susceptible slopes around the lake. The geotechnical investigation involved evaluating the condition of the earthen dam embankment, lateral base drain, sapping failures along the shore near the dam, and seepage around concrete spillway.
01/21 – 12/25 (Estimated)	**Rehabilitation of Five Pennsylvania Dams, Various Locations, PA.** *Pennsylvania Fish & Boat Commission.* Senior Geologist. Responsibilities included: test boring inspection, drilling contractor coordination, lab testing coordination, lab testing requisitions, boring contract administration, boring contract quantity tracking, subsurface findings interpretation, geologic literature review, and report writing. Michael Baker is providing engineering services to bring five dams into compliance with Pennsylvania Department of Environmental Protection regulations. Michael Baker's services include dam inspections, hydrologic and hydraulic evaluations, geotechnical investigations, structural assessments, alternatives analyses, dam-break modeling, inundation mapping, permitting, agency coordination, and construction services.
02/02 – 12/07	**Geotechnical Open-End Services, Allegheny County, PA.** *Allegheny County Department of Public Works.* Senior Geologist. Responsible for field reconnaissance of various landslide projects. Michael Baker was retained by the County in 2002 to provide on-call Geotechnical support to address Geotechnical impacts to the County's aging infrastructure. Geotechnical services provided under this contract included emergency response, landslide remediation, addressing lateral support issues, retaining wall failures, drainage improvements, flood facility studies, dam inspections, dam rehabilitation, roadway subgrade evaluations, subsurface investigations, laboratory testing and construction support.
04/08 – 09/09	**Mine Water Supply Dam, Greene County, PA.** *Emerald Coal Resources, LP.* Senior Geologist. Responsible for oversight and preparation of test boring and testing program development and implementation test; test borings and laboratory testing contract; geotechnical field reconnaissance, geotechnical analysis, slope stability and cut slope evaluation, earthwork rock and soil, geotechnical details and treatments, alternative analysis and report preparation. Michael Baker provided engineering services for the construction of a 55-meter-tall earthen embankment dam to create a two million-cubic-meter freshwater reservoir to supply water for a new mine facility. Michael Baker's services included site selection, field investigations, geotechnical services, hydraulic and structural design, cost estimates, construction scheduling, preparation of contract documents, permitting, and construction oversight.
07/14 – 09/14	**Dam Rehabilitations, Scioto, Pike, and Vinton Counties, OH.** *Ohio Department of Natural Resources.* Senior Geologist. Senior Geologist responsible for site reconnaissance and development of subsurface investigations for dam rehabilitations. Michael Baker is providing engineering services for the rehabilitation of several dams to bring them into compliance with current state safety regulations. Michael Baker's services include dam inspection, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection.
01/20 – 01/20	**Pennsylvania DCNR Dam Safety Projects, Various locations, PA.** *DCNR.* Senior Geologist. Responsible for geotechnical investigation of various dams projects that include reconnaissance, subsurface investigation and geotechnical reporting. Michael Baker's is providing dam inspection and assessment, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection to assist the client with implementing its dam safety program. Projects under this contract include Little Buffalo Dam inspection, Pymatuning Dam, Raccoon Creek Dam, Laurel Mountain State Park Water Supply Dams, Lackawanna State Park - Trostle Pond Dam, and Laurel Hill State Park - Penn Scenic View Lake Dam.

10/19 – 07/20	**Statewide Dam Assessment - Clark Lake Wildlife Area Dam, OH.** *Ohio Department of Natural Resources.* Senior Geologist. Responsible for site reconnaissance of dam site to identify geotechnical features and confirm information obtained in dam inspection reports. Also responsible for overview of subsurface investigation and test boring records.
03/20 – 07/20	**Cowan Lake Dam Assessment, OH.** *Ohio Department of Natural Resources.* Senior Geologist. Responsible for site reconnaissance of dam site to identify geotechnical features and confirm information obtained in dam inspection reports. Also responsible for overview of subsurface investigation and test boring records.

Firm employed by **Michael Baker**			
Name	**Gang Zuo, PhD, PE**	Years of relevant experience with this employer	**➲ 15**
Title	Civil Engineer	Years of relevant experience with other employer(s)	**➲ 3**
Degree(s) / Years / Specialization		Ph.D. / 2003 / Geotechnical Engineering, University of Tennessee M.S. / 1998 / Geotechnical Engineering, Tongji University, Shanghai, China B.S. / 1995 / Civil Engineering, Tongji University, Shanghai, China	
Active registration number / state / expiration date		PE075568 / Professional Engineer, Pennsylvania / 09/30/2023	
Year registered	2008	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Analysis Support)**	

Dr. Zuo is a civil engineer in Michael Baker's Civil Engineering Department. His experience includes conventional- and pavement-related geotechnical design, analysis and instrumentation. He has experience in specialty geotechnical design, such as soil nail wall, ground anchor, micropile foundation, soldier pile and lagging system. He has experience in finite element method (FEM), including FEM program development and user defined material implementation into existing FEM program.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
01/21 – 12/25 (Estimated)	**Rehabilitation of Five Pennsylvania Dams, Various Locations, PA.** *Pennsylvania Fish & Boat Commission.* Geotechnical Engineer. Performed external stability analysis of the dams at Cannonsburg and Dutch Town for existing and proposed conditions. Assisted in the report writing. Michael Baker is providing engineering services to bring five dams into compliance with Pennsylvania Department of Environmental Protection regulations. Michael Baker's services include dam inspections, hydrologic and hydraulic evaluations, geotechnical investigations, structural assessments, alternatives analyses, dam-break modeling, inundation mapping, permitting, agency coordination, and construction services.
03/13 – 03/13	**Somerset Lake Dam Renovations, Somerset Township, PA.** *Pennsylvania Fish and Boat Commission.* Geotechnical Engineer. Performed dam stability analysis. Michael Baker is providing engineering services for the Somerset Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PFBC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations. Somerset Lake Dam was constructed in 1956 and creates Somerset Lake, which is a heavily used recreational facility. Michael Baker's tasks include reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic analysis; performing a topographical survey, geotechnical investigation, and structural analysis to evaluate current conditions; identifying and analyzing rehabilitation alternatives; and providing construction management services.
02/10 - 04/10	**Dutch Fork Lake Dam Condition Assessment and Rehabilitation Design, Donegal Township, Washington County, PA.** *Pennsylvania Fish and Boat Commission.* Geotechnical Engineer. Participated in the design and analysis to improve the stability of the existing dam, and report writing. Michael Baker provided engineering services for rehabilitation of the Dutch Fork Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PBFC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Dutch Fork Lake Dam was constructed in 1959 and creates Dutch Fork Lake, which was a heavily used recreational facility until PFBC breached the dam in 2005 after damage to the spillway occurred during Hurricane Ivan. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing hydrologic and hydraulic analyses; performing topographical surveys and geotechnical investigations to evaluate current conditions; identifying and analyzing rehabilitation alternatives; developing designs; and providing construction management services.
0210 – 04/10	**Rehabilitation of the Canonsburg Lake Dam, Peters and North Strabane Townships, PA.** *Pennsylvania Fish and Boat Commission.* Geotechnical Engineer. Participated in the design and analysis to improve the stability of the existing dam, and report writing. Michael Baker performed an inspection, developed design and construction documents, and provided construction administration services for rehabilitation of the Canonsburg Lake Dam in Washington County, Pennsylvania, to ensure compliance with Pennsylvania Department of Environmental Protection regulations. The Canonsburg Lake Dam is owned by the Pennsylvania Fish and Boat Commission. The concrete gravity dam was built in 1943 to create a water supply for ALCOA's Canonsburg Forging Plant during World War II; currently, Canonsburg Lake is used as a recreational facility. Michael Baker's tasks included reviewing existing drawings and reports; performing a field assessment, hydrologic and hydraulic analysis, and subsurface investigation to evaluate the current condition and stability of the dam; identifying and screening alternatives and developing remediation designs and cost estimates; and providing construction management services.
01/13 – 11/15	**Dam Rehabilitations, Scioto, Pike, and Vinton Counties, OH.** *Ohio Department of Natural Resources.* Geotechnical Engineer. Performed dam stability analysis. Michael Baker is providing engineering services for the rehabilitation of several dams to bring them into compliance with current state safety regulations. Michael

	Baker's services include dam inspection, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection.
01/13 – 08/13	**Roosevelt Lake Dam Rehabilitation, Scioto County, OH.** *Ohio Department of Natural Resources.* Geotechnical Engineer. Performed slope stability and seepage analyses. Assisted in report preparation. Michael Baker provided engineering services for the rehabilitation of the Roosevelt Lake Dam to ensure compliance with the department's dam safety regulations with regard to overtopping protection during the design event and spillway capacity. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, alternatives identification and evaluation, rehabilitation design, and construction management and inspection.
05/15 - 09/18	**Lake Loramie Dam Rehabilitation, Shelby County, OH.** *Ohio Department of Natural Resources.* Geotechnical Engineer. Responsible for performing seepage and stability analyses for embankment and spillway. Michael Baker provided engineering services for the rehabilitation of Lake Loramie Dam as an interim risk reduction (IRR) project. The existing spillway has exhibited severe structural deterioration and was replaced with a labyrinth spillway adjacent to the existing spillway. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, rehabilitation design, and construction management and inspection services. The improvements to the dam included select partial dam removal, embankment construction (including drainage filters), construction of labyrinth spillway, stilling basin, bank floodwall, control tower, placement of a pedestrian bridge over the spillway, and site upgrades to the immediate dam area. Normal pool was maintained throughout construction to limit the impact to the park, homeowners, and businesses surrounding the lake. The rehabilitations were completed as part of an IRR project due to the unsatisfactory structural condition of the existing spillway.
01/14 – 12/18	**Chapman Dam Rehabilitation Contract 2012-2020, Pleasant Township, PA.** *Pennsylvania Fish and Boat Commission.* Geotechnical Engineer. Performed dam stability analysis. Michael Baker performed analyses, provided permitting services, developed designs, and performed construction administration for the rehabilitation of the Chapman Dam, located on the West Branch of Tionesta Creek, within Chapman State Park. Michael Baker was responsible for designing the renovations of the existing spillway and outlet works, addressing stability and seepage concerns with the embankment, and evaluating the dam's compliance with PADEP regulations regarding overtopping protection during the design event.

Firm employed by **Michael Baker**			
Name	**Mohamed Bagha, PE, CFM, PMP**	Years of relevant experience with this employer	➲ **16**
Title	Water Resource Project Manager	Years of relevant experience with other employer(s)	➲ **6**
Degree(s) / Years / Specialization		Master's Certificate / 2011 / Project Management Program, University of Pittsburgh M.E. / 2003 / Civil Engineering, The State University of New York at Buffalo B.E. / 1998 / Civil Engineering, National Institute of Technology, Nagpur, India	
Active registration number / state / expiration date		PE 102919 / Texas / 03/31/2022 Project Management Professional (PMP) / Nationwide / 08/28/2023 Certified Floodplain Manager 1508-08N/ Nationwide / 12/31/2022	
Year registered	2006 (PE) | 2011 (PMP) | 2003 (CFM)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 6a. Hydrology & Hydraulics Lead**	

Mr. Bagha is a recognized Subject Matter Expert in 1D, 2D, and unsteady HEC-RAS modeling applied towards designing sustainable solutions for flood risk mitigation at multiple scales for clients like Harris County Flood Control District (HCFCD). Mr. Bagha performs discovery and reviews flood ordinances related to local land use as part of his efforts. He performs advanced 1D, 2D, and unsteady model development for H&H, storm water management, and watershed planning. He has expertise with flood hazard identification using HEC-HMS, HEC-DSS, and HEC-RAS and is proficient with GIS applications for water resources. His participation in flood studies for FEMA and CTPs gives him the experience to develop right-sized modeling solutions. He is well versed in FEMA modeling and mapping guidelines.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
12/20 – 05/23 (Estimated)	**Louisiana Watershed Initiative Modeling Contract - Region 6, LA.** *DOTD.* Deputy Project Manager and Modeling Manager. Provided input on tiered modeling approaches and reviewed modeling design plans for multiple HUC-8 watersheds. Michael Baker is providing engineering and modeling services to DOTD for Region 6 for the LW). The LWI project was launched in 2018 and introduced a watershed-based approach to reducing flood risk in Louisiana. It is organized by seven modeling regions, each of which encompasses multiple HUC-8 watersheds. For the first task-order of the contract, Michael Baker collected existing watershed datasets, models, and studies, developed and proposed detailed modeling design approaches with schedules and cost estimates, and prepared data gap analysis and collection reports.
10/05 – 03/08	**Buckeye FRS No. 1 Dam Rehabilitation Study, Buckeye, AZ.** *The Flood Control District of Maricopa County (FCDMC).* Program Manager. Provided technical and management oversight to perform hydrology and hydraulics to support alternative selection for dam rehabilitation. Michael Baker conducted extensive hydrologic, hydraulic, and sedimentation analyses to assess the individual merits of several alternatives to mitigate considerable transverse cracking in Buckeye FRS No. 1. An additional task included a downstream inundation analysis for a portion of the town west of Watson Road to the Hassayampa River. The results were used to compare feasibilities with and without dam scenarios in terms of cost-benefit ratios. Several cross-sections were placed along prominent flow paths between FRS No. 1 and the Gila River and the 100 years, 24-hour delineation was determined.
01/14 – 12/14	**Lake Ralph Hall Third Party, TX.** *Upper Trinity Regional Water District.* Water Resources Engineer. Responsibilities included review of the Water Availability Models (WAM) prepared for the without-dam and with-dam scenarios to ensure the dam and the associated draft operations plans are properly reflected in the models. Was also responsible for documenting impacts to downstream water rights holders as a result of construction of the proposed dam.
10/04 - 09/05 (with previous employer)	**Flood Buckeye FRS#1 Dam Rehabilitation Project, AZ.** *Maricopa County Flood Control District. Water* Resources Analyst. Responsible for performing hydrologic and hydraulic analyses for existing condition and alternative options. Co-determined the scope of work that would be required to evaluate and select from proposed alternatives for dam rehabilitation. The selection of an acceptable alternative will ultimately lead to a 15% design effort. Performed impact studies of the inflow of the Buckeye FRS Outflow on the Hassayampa River. Prepared hydraulic modeling and inundation mapping for 115 linear miles in the areas downstream of the FRS for the with-dam without-dam scenarios in support of NRCS Dam Economic Analysis, and evaluated various proposed alternatives for their hydraulic performances and flood protection benefits. This project is underway.

07/12 - 02/18	**Cypress Creek Overflow Management Plan, Harris County, TX.** *Harris County Flood Control District.* Project Manager. Developed **hydrologic models** of existing conditions, evaluated proposed flood mitigation alternatives using HEC-HMS, modeling channel enhancements using **HEC-RAS 1D steady** and **1D unsteady** models and **XP Storm 1D-2D models** to model the overflow under various mitigation scenarios.
10/18 - 10/19	**Cypress Regional Drainage Plan, Harris County, TX.** *Harris County Flood Control District.* QA/QC Lead. Responsibilities include QA/QC of all deliverables. Michael Baker is updating a drainage master plan for Cypress Creek tributary watersheds in northwest Harris County and expanding it to include Cypress Creek. **HEC-HMS, HEC-RAS 1D, 1D-2D** and **2D** and **HEC-DSS** software is being used to complete this project.
10/13 - 09/15	**Armand Bayou Drainage Study, Pasadena, TX.** *City of Pasadena, Texas.* QA/QC Engineer. Performed QA/QC of modeling for City of Pasadena to correct **floodplain modeling** and **mapping**. Michael Baker evaluated flooding problems in Armand Bayou watershed using a **2D** model to quantify split flow between B113-00-00 and B115-00-00, and used the resulting information to update FEMA's **H&H models** and mapping.
05/06 - 12/12	**Flood Recovery Data, CF3R JV Task Order 28, Harris, Jefferson, and Orange, TX.** *FEMA, Region VI.* Water Resources Engineer. Performed Base Map & Topographic Data Development, and Report writing. Conducted **H&H modeling** and **Floodplain Mapping** to support countywide **DFIRM** Updates. Created floodplain work maps, DFIRM data bases, FIRMs and **FIS** Reports. Performed **Combined Probability Analyses** to determine BFEs within **coastal areas** in Brazoria County. Michael Baker provided Flood Recovery Data for the coastal areas of Harris, Jefferson, and Orange County, Texas.
08/06 - 04/14	**Digital Floodplain Mapping Updates, CF3R JV Task Order 30, Brazoria, Montgomery Counties, Texas.** *FEMA, Region VI.* Water Resources Engineer. Performed **combined probability analyses** to determine base flood elevations within **coastal areas** in Brazoria County. Prepared Flood Insurance Study report and attachments. Michael Baker provided development of FIRMs for Brazoria and Montgomery Counties, Texas.
08/06 - 04/14	**French Creek Floodplain Environmental and Engineering Services, Helotes, TX.** *Bexar County.* Project Manager. Performed **H&H analyses** to design resilient conveyance improvements along four tributaries in the City of Helotes, TX. Conceptualized and designed a **cost-saving flow diversion channel alternative**. Provided engineering services to assist in creating all-weather drainage crossings and removing multiple residential properties from the **floodplain.** Michael Baker performed **natural channel design** tasks for 5800' of channel.
08/05 - 10/10	**Digital Floodplain Mapping Updates, CF3R JV Task Order 22, Fort Bend County, TX.** *FEMA, Region VI.* Civil Engineer. Responsibilities included hydrologic and hydraulic modeling using **HEC-HMS** and **HECRAS**, and **floodplain mapping** using **GIS**, and performing **QA/QC of floodplains**. Michael Baker provided the Digital Flood Plain Mapping Update for Fort Bend County, Texas. Project activities included restudy of 90 miles of the Brazos River, 101 miles of redelineation of existing Zone AE streams; 296 miles of Automated Approximate Study of existing Zone A streams; 48 new DFIRM panels at 1"=1000' and 1"= 2000' scale; production of the countywide FIS report and profiles preliminary **DFIRM** and **FIS** preparation; post-preliminary processing activities; reporting activities; and intensive outreach activities due to **levee** recertification issues.
07/10 - 07/12	**Flooding Reduction Feasible Options Study, Fort Worth, TX.** *City of Fort Worth.* Water Resources Engineer. Responsibilities include **data collection** and evaluation, generation of project metrics to evaluate and rank alternative plans, and participation in meetings with client and stakeholders. Michael Baker led a multidisciplinary team (hydrologists, land planners, economists, and communications professionals) in a study to identify feasible options to recommendations made to reduce flooding in flood-prone urban watersheds.

Firm employed by **Michael Baker**			
Name	**Yingjian "Jim" Han, PE, CFM**	Years of relevant experience with this employer	➲ **<1**
Title	Project Manager	Years of relevant experience with other employer(s)	➲ **16**
Degree(s) / Years / Specialization		M.S. / 2005, Environmental Engineering, Vanderbilt University, Nashville, TN B.S. / 1998, Environmental Engineering, Tsinghua University, Beijing, China	
Active registration number / state / expiration date		35782 / Louisiana / 03/31/2023 Certified Floodplain Manager, Texas, 2820-15N	
Year registered	2010 (PE) | 2009 (CFM)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 4. Hydrology & Hydraulics Support**	

Mr. Han brings 16 years of experience in flood control, storm water management and modeling, civil and drainage design, and project management. He is experienced in H&H modeling using HEC-HMS, HEC-RAS (1D and 2D), XPSWMM (1D and 2D) and is skilled at drainage plan development and PS&E. Mr. Han has served as Project Manager and Lead Design Engineer on more than 20+ drainage design, H&H modeling, and flood control & mitigation projects, Mr. Han has successfully managed large teams to deliver complex modeling projects on time and under budget. After Hurricane Katrina, he spent 10 years in Louisiana working for a major national engineering firm to evaluate, analyze, and design Hurricane and Storm Damage Risk Reduction System (HSDRRS) to provide 100-year level of protection to the New Orleans metro area. The total construction costs of the HSDRRS projects Mr. Han worked on exceeded $1 Billion. Mr. Han is proficient with a wide array of H&H modeling applications and has the skill and experience to identify the appropriate tool to apply for each unique situation for comprehensive drainage plan development.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
09/21 – Present	**Louisiana Watershed Initiative Modeling Contract – Region 6, Louisiana.** *DOTD.* Team Leader. As the team leader for Eastern Louisiana Coastal Watershed (HUC 08090203), Jim oversaw the development of complex H&H modeling and was responsible for the setup, calibration, and validation of the HEC-RAS 2D Rain-on-Grid models. Mr. Han also coordinated and facilitated the development of the HEC-RAS 2D modeling guidelines, naming conventions, and data collection. The Louisiana Watershed Initiative (LWI) project was launched in 2018 and introduced a watershed-based approach to reducing flood risk in Louisiana. Michael Baker International is the prime consultant for LWI Region 6 which encompasses 4 HUC-8 watersheds totaling 9,891 square miles of watershed area.
10/20 – 07/21	**HCFCD Cedar Bayou Watershed Unit No. Q122-00-00 Preliminary Engineering Study, Harris County, Texas** *Harris County Flood Control District.* Mr. Han served as Project Manager for this channel improvement H&H project using the advanced 1D/2D hydraulic modeling tool of HEC-RAS. Channel Unit No. Q122-00-00 is a tributary of Cedar Bayou and it experienced several significant flooding events including Hurricane Alicia, Hurricane Ike, and Hurricane Harvey since currently it only has a capacity to provide two-year level of service. Several mitigation alternatives were developed and simulated by unsteady state 1D HEC-RAS models consisting of various channel modifications. Two storage areas were connected to the 1D channel through lateral weirs at separate locations to investigate the off-line detention impact to flood reduction. A 1D/2D coupled HEC-RAS model was also developed to study the additional flow spilled over from a nearby channel to Q122-00-00. Finally, a Preliminary Engineering Report (PER) is to be prepared to document existing conditions, H&H modeling methods, results & findings, and design alternatives. The required right-of-way acquisitions, utility conflicts, and construction cost estimates were included in the PER. He was responsible for managing and coordinating with subconsultants for geotechnical investigation, survey, and Subsurface Utility Engineering (SUE).
12/19 – 04/20	**Bellerive and Clarewood Area Drainage Improvement Study by 2D XPSWMM, Houston, Texas.** *City of Houston.* Project Manager and H&H Modeler. The project involves the regional drainage improvement study using 2D XPSWMM. The goals of the study were to identify locations where frequent flooding occurs, evaluate the drainage system capacity, and determine what solutions can be employed to reduce the frequent flooding. The new Atlas 14 rainfall data was utilized to develop design storms (unit hydrograph method) and peak flows (rational method). An existing condition XPSWMM Version 2019 model was developed for two-year and 100-yearstorm events respectively. Spill crest elevations were estimated based on elevations from the TNRIS 2018 LiDAR dataset. Storm sewer locations, sizes, and invert elevations were obtained from the survey, COH GIMS data, and as-built drawings. He developed two proposed condition XPSWMM 2D models that included new and larger storm sewer pipes at strategic locations to replace existing ones - gaining capacity and in-line detention via oversized storm sewer with restrictors.
03/16 – 01/17	**Lexington Blvd and Highlands Section III Drainage Improvements - Modeling and PS&E, Sugar Land, Texas.** *City of Sugar Land.* Project Manager and Lead Drainage Design Engineer. Responsible for the development of construction plans of storm sewer system improvements in the Highlands Section III neighborhood in Sugar Land. To mitigate the neighborhood flooding issue, a dynamic unsteady-state H&H model was established to identify storm system capacity deficiencies and several design alternatives were developed based on the model results. After discussions with the City and local stakeholders, a preferred design alternative was chosen

	for final design. The project called for the construction of enlarged and parallel storm sewers and extra curb inlets. A new outfall to Oyster Creek was proposed to divert flows from the existing storm sewer system.
10/07 – 06/10	**Hurricane and Storm Damage Risk Reduction System (HSDRRS) – Lake Pontchartrain and Vicinity LPV 145, LPV 146, LPV 147, LPV 148 and LPV 149 Floodwall, St Bernard Parish, Louisiana.** *USACE, New Orleans District.* Water Resources Design Leader. This project is to design a 22-mile long floodwall flood protection system to provide 100-year level of flood protection in St Bernard Parish, which includes T-wall, earth levee berms, flood gates, and pump stations. Mr. Han served as lead design engineer in this preliminary engineering and PS&E project. Responsibilities included: 1. Evaluating and assessing various floodwall alignment and level of protection; 2. coordinating with other disciplines' design leaders to effectively resolve issues regarding engineering design and constructability; 3. worked with the contractor to identify major design elements and their constructability for expedited construction. For this project, the contractor got involved early in the design phase to shorten the overall construction schedule. 4. developing construction plan and specification, preparing the final bidding package; 5. providing engineering services during construction and overseeing the contractor's performance.
08/11 – 11/13	**Trinity River Levee System Design in Support of the 100-Year FEMA Accreditation, Dallas, Texas.** *City of Dallas.* This project is to help City of Dallas evaluate Trinity River Levee System existing condition, identify potential failure modes, and finally propose and design engineering improvement to make the levee system meet FEMA 100-year accreditation criteria. Mr. Han worked as a civil design task leader and was responsible for: 1. Researching and developing Trinity River Levee System alignment and Right of Way (East Levee, West Levee, CWWTP Levee, and Rochester Levee); 2. Providing civil engineering design, utility relocation and protection, H&H support to develop levee improvement alternatives; 3. Leading civil design of the levee improvement project, including final construction plan development, specifications writing-up, quantity takeoff, and bid package preparation; 4. Providing engineering support during construction, drafting responses to RFIs from the contractor, approving submittals by the contractor
03/14 – 05/15	**NFL-05 (La Reussite to Myrtle Grove) and NFL-06 (Myrtle Grove to St. Jude) Interior Drainage Canal Relocation, Plaquemines Parish, Louisiana.** *Plaquemines Parish Government.* Water Resources Design Leader. This project is to design and relocate two interior drainage canals in basins NFL-05 and NFL-06 in Plaquemines Parish. The original canals running parallel to the levees would be filled up by levee enlargement projects in the area and thus new canals need to be designed and relocated to the center of the basins. Served as lead design engineer in this PS&E project. Responsibilities included: 1. helping the task order manager to develop project scope of work, fee proposal, and work plans as civil and water resources discipline leader; 2. developing basin hydrologic models by using HEC-HMS to model the basin's existing and future to calculate corresponding runoff hydrographs and peak flows; 3. modeling and sizing new drainage canals by applying HEC-RAS to route runoff hydrograph through the proposed canals; 4. preparing project construction plans, specifications and bidding package.
10/08 – 11/11	**Hurricane and Storm Damage Risk Reduction System (HSDRRS) - West Bank and Vicinity, Hero to Oakville, Phase II, First Lift Levee Enlargement & Pumping Station, Plaquemines Parish, Louisiana.** *USACE, New Orleans District.* Water Resources Design Leader. This project is to design a levee system, which includes earthen levee, floodwall, a box culvert and a storm water pump station, to provide 100-year level of flood protection to 20,000 residents in Plaquemines Parish for the first time in history. Served as lead design engineer in this PS&E project. Responsibilities included: 1. designing an earthen levee system in the marsh by using a sand platform as working base; 2. coordinating with other disciplines' design leaders to effectively resolve issues regarding engineering design and constructability; 3. developing construction plan and specification, preparing the final bidding package; 4. providing engineering services during construction and overseeing the contractor's performance.
09/12 – 11/13	**Highway LA 66 Bridge over Bayou Sara Rehabilitation, St Francisville, Louisiana.** *Louisiana DOTD.* Water Resources Engineer. Mr. Han served as lead bridge hydraulic engineer for this bridge rehabilitation project. He worked with roadway and structural engineers to evaluate new bridge and approaching roadway alignment and bridge low chord elevations. He developed the bridge hydraulic models by using HEC-RAS to model the bridge's existing and proposed conditions under 50-yr, 100-yr, 200-yr and 500-yr flood events. He calculated the bridge scour depths and designed the bridge scour countermeasures by following the guidelines of DOTD 2011 Hydraulics Manual, FHWA HEC-18 and HEC-23.

Firm employed by **Michael Baker**			
Name	**Craig Wenger, PE, AICP, CFM**	Years of relevant experience with this employer	**➲ 10**
Title	Project Manager	Years of relevant experience with other employer(s)	**➲ 1**
Degree(s) / Years / Specialization		M.S. / 2009 / Geosciences B.A. / 2008 / Environmental Studies/Planning/Economics	
Active registration number / state / expiration date		PE 20944 / Delaware / 06/30/2022 Certified Floodplain Manager US-10-05384 / Nationwide / 01/31/2023 American Institute of Certified Planners 029145 / Nationwide / 01/31/2022	
Year registered	2017 (PE) | 2016 (AICP) | 2010 (CFM)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 6, b and c. Hydrology & Hydraulics Support**	

Mr. Wenger has extensive experience with the full HEC suite of tools and a keen understanding of their interrelation providing the Louisiana Watershed Initiative with a unique modeling expert. His experience includes: LifeSim, HEC-DSS, SSP, HMS, MET-VUE, HMS, RAS, FIA, FDA, and WAT. Mr. Wenger completed a pilot review of LifeSim's applicability and integration with HEC-FDA and HEC-FIA software. His extensive experience includes: performing discovery tasks, reviewing flood ordinances related to local land use, hydrologic studies, stormwater management, stream modeling, FEMA Flood Studies, and flood economics forecasting.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable PR(s).
11/20 – 05/23 (Estimated)	**Louisiana Watershed Initiative Modeling Contract - Region 6, LA.** *DOTD.* Senior Advisor. Responsible for providing senior oversight and advise for the data collection and analysis of hydraulic datasets, models, and studies; and proposition of modeling design approaches for 4 HUC's of Region 6 for Louisiana Watershed Initiative (LWI). Michael Baker is providing engineering and modeling services to the DOTD for Region 6 for the Louisiana Watershed Initiative (LWI). The LWI project was launched in 2018 and introduced a watershed-based approach to reducing flood risk in Louisiana. It is organized by seven modeling regions, each of which encompasses multiple HUC-8 watersheds. For the first task order of the contract, Michael Baker will collect existing watershed datasets, models, and studies, develop and propose a detailed modeling design approach with schedules and cost estimates, and prepare a data gap analysis and collection report.
11/17 - 11/22 (Estimated)	***Resilient NJ Regional Planning Grants Program Assistance, State of New Jersey.*** *New Jersey Department of Environmental Protection.* Program Manager. Craig oversaw all the team's work for this statewide modeling project. This included the development of the **watershed modeling** methodology utilizing the full suite of HEC tools through the development process. Craig led the development of the scenario planning method to develop **resilient strategies** that work across the political boundaries that guide the communities today. Michael Baker is providing **grant management services**, technical assistance, watershed modeling methodology development, and monitoring and oversight for the duration of the Resilient NJ Program.
10/10 - 03/18	***Risk MAP and Coastal Flood Hazard Study, Multiple Locations, California.*** *FEMA*. Water Resources Engineer. Craig oversaw the development of **H&H models** and performed **floodplain mapping**. Michael Baker supported FEMA in conducting a **coastal flood hazard study** for the coastline of California. Results from this Open Pacific Coast (OPC) Study produced flood and wave data for the National Flood Insurance Program (**NFIP**) Flood Insurance Study (**FIS**) report and regulatory Flood Insurance Rate Map (**FIRM**) panels.
05/08 - 08/09	**Upper Delaware River Comprehensive Study, Structure Inventory, and Economic Modeling, Mercer, Hunterdon, Warren, and Gloucester Counties, New Jersey.** *General Services Administration.* Technical Specialist. Prepared a **HEC-RAS** model, **GIS** data, and created a **HEC-FDA** economic model. Integrated the three data sets into one cohesive study for flooding along the Delaware River. Craig oversaw the development of code for a database that identified inaccuracies in **LiDAR** and survey information and assured quality control for the project. Michael Baker used surveying, GPS, GIS, and LiDAR tools to capture structural information for 1,700 buildings within the 100-year floodplain of the Delaware River and its tributaries within 14 communities.
06/09 - 12/09	***Red Clay Creek Flood Damage Analysis, Newcastle County, Delaware.*** *U.S. Army Corps of Engineers, Philadelphia District. Technical Specialist. Prepared a **HEC-RAS** model, GIS data, and created a HECFDA model. Integrated the three data sets into one cohesive study for flooding along the Red Clay Creek. This study included **flood mapping, economic analysis,** and **damage reach breakdowns.** Under a General Services Administration multiple-award schedule, Michael Baker provided continuing services in support of the economic investigation for flooding and related mitigation along Red Clay Creek.*
01/10 - 11/10	**Flood Mitigation Analysis, New Jersey.** *U.S. Army Corps of Engineers, Philadelphia District.* Water Resources Engineer. Craig led the development of **hydrologic** and **hydraulic models**, **economic data**, **HECFDA models**, and developing **floodplain mapping**. Craig oversaw the development of a feasibility study of multiple flood mitigation projects including **levees** and **floodwalls**.

09/08 - 01/11	**Regional Task Order, Multiple Counties, Maryland and Virginia.** *FEMA, Region III.* Technical Specialist. Performed a wide range of tasks including profile creation and production, **DFIRM** annotation editing, flood area delineation, **HEC-RAS modeling**, **HEC-HMS modeling**, **FIS** production, and development and training of employees with these tasks. The scope of work on this task order included FEMA Map Modernization program tracking and map production and adoption services, as well as the completion of preliminary production and the post-preliminary processing phases on the Fairfax County Virginia **DFIRM**, the Prince Georges County Maryland **DFIRM**, in addition to other ad-hoc mapping support tasks.
07/04 - 10/14	**Digital Flood Insurance Rate Maps (DFIRMs).** *FEMA.* Technical Specialist. Performed a wide range of tasks included profile creation and production, **DFIRM** annotation editing, **flood area delineation**, **HECRAS** modeling, **HEC-HMS modeling, FIS** production, and development and training of employees with these tasks.

Firm employed by **Michael Baker**			
Name	**Sahas Shrestha, PE, CFM**	Years of relevant experience with this employer	➲ **2**
Title	Water Resource Engineer	Years of relevant experience with other employer(s)	➲ **11**
Degree(s) / Years / Specialization		M.S.C.E / 2010 / Civil Engineering - Water Resources, University of Louisiana at Lafayette B.E / 2008 / Civil Engineering, Tribhuvan University, Nepal	
Active registration number / state / expiration date		39760 / Louisiana / 09/30/2023 Certified Floodplain Manager / Texas / 3016-16N / 12/31/2021	
Year registered	2013 (PE) | 2015 (CFM)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Hydrology & Hydraulics Support**	

Mr. Shrestha has extensive experience in the fields of H&H including H&H numerical modeling, floodplain modeling and mapping, open channel and watershed studies, detention pond and culvert design. He has experience developing floodplain studies, flood risk analyses, and mitigation design for multiple municipalities along the Gulf Coast in Texas and Louisiana, including the Harris County Flood Control District.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
09/21 – 05/23 (Estimated)	**Louisiana Watershed Initiative Modeling Contract – Region 6, LA.** *DOTD.* Team Leader. As the team leader for East Central Louisiana Coastal Watershed (HUC 08090201) comprising 2700 square miles, Mr. Shrestha oversaw the development of complex H&H modeling and was responsible for the setup, calibration, and validation of the HEC-RAS 2D Rain-on-Grid models. The Louisiana Watershed Initiative (LWI) project was launched in 2018 and introduced a watershed-based approach to reducing flood risk in Louisiana. Michael Baker International is the prime consultant for LWI Region 6 which encompasses 4 HUC-8 watersheds totaling 9,891 square miles of watershed area.
04/11 – 06/12	**Black Lake Bayou Study, Red River Parish, LA.** *EnCana.* H&H Engineer. Developed a hydrologic and hydraulic model for Black Lake Bayou located in Red River Parish in Louisiana. Responsible for H&H numerical modeling, calibrating the models and preparation of floodmaps. The models were used for flood hazard assessment and mitigation measures for oil and gas drilling along the bayou. He used HEC-RAS, HEC-HMS and Arc GIS software to develop the numerical models to simulate different frequency rainfall events.
02/15 – 11/15	**Bayou Guy Tributary H&H Study, Calcasieu Parish, LA.** *Calcasieu Parish Police Jury.* H&H Engineer. Developed hydrologic and hydraulic numerical models for existing conditions and future developed conditions for Bayou Guy watershed. He used HEC-RAS, HEC-HMS and Arc GIS software to develop the numerical models to simulate different frequency rainfall event.
08/14 – 02/16	**Flood Inundation Mapping, Calcasieu Parish, LA.** *Calcasieu Parish Police Jury.* Project Manager. Managed the Flood Inundation Mapping project for entire Calcasieu Parish. Developed unified flood map layer using flooding information from different sources for Calcasieu Parish.
03/12 – 09/13	**Hydraulic Model and FEMA Map Revision for Isaac Verot/Anslem Coulee, Lafayette, LA.** L*afayette Consolidated Government.* H&H Engineer. Responsible for development of 1-D unsteady model for Isaac Verot/Anslem Coulee. The model was used to revise Flood Insurance Rate Map (FIRM). HEC RAS, HEC-HMS, ArcGIS was used to develop and calibrate the model.
10/21 – 11/21	**Precinct 2 Drainage Improvement Needs Assessment and Project Development, Harris County, TX.** Senior Engineer. Responsible for development of CIP sheets, recommendations for scoring criteria and weights assigned to various criteria. The purpose of this study was to review the Community Development Block Grant Disaster Relief (CDBG-DR) studies that were conducted in eight watersheds of Precinct 2 and develop a prioritized list of 25 flood mitigation projects that can be implemented. Mr. Shrestha performed the review of numerous watershed studies to identify the existing flood loss and claim data. Existing H&H model results including ponding depth and inundation extents were imported to ArcGIS for easy spatial analysis and score calculation. Upon discussion with Precinct 2, Mr. Shrestha incorporated two new scoring categories to better address the local needs and concerns - Flood Vulnerability Index (FVI) and Neighborhood Drainage Structures Capacity. The problem area list was adopted by Precinct 2 to prioritize future drainage study sequence when funding becomes available.
10/18 – 09/20	**Cypress Regional Drainage Plan, Harris County, TX.** *HCFCD.* Civil Engineer. Worked on the study to evaluate the benefits of multiple detention basins along the Cypress Creek. Twelve detention basins were simulated in different combinations to analyze the flood reduction benefits. A detailed 1D/2-D was developed to analyze different alternatives and their flood reduction benefits. Michael Baker updated a drainage master plan for Cypress Creek tributary watersheds in northwest Harris County and expanded it to include Cypress Creek. As part of this fast-paced project, Michael Baker harnessed advances in modeling capabilities and more recent LiDAR and rainfall data to update a study prepared in 2003 for all Cypress Creek Tributary watersheds, except for Little Cypress Creek. Michael Baker studied 17 streams in the eight tributary watersheds

	to evaluate feasible flood mitigation alternatives and recommended mitigation plans that can be advanced to design. It also evaluated the effectiveness of large regional detention ponds along 27 miles of Cypress Creek at Eldridge Parkway and at Stuebner Airline Road.
11/16 – 07/17	**Cane Island Branch Flood Protection Planning Study, Katy, Texas.** *City of Katy.* H&H Engineer. Worked on a flood protection planning study for the City of Katy. This project included development of hydraulic and hydrologic model for Cane Island Branch including portions of Cypress Creek. The model was used to develop mitigation measures for future development and planning for emergency measures. A detailed 1-D/2-D hydraulic model was developed to simulate overflow from Cypress Creek to Cane Island Branch. A technical report with analysis and results was prepared at the end of the project.

Firm employed by **Michael Baker**			
Name	**Manoj KC, PhD, PE, CFM**	Years of relevant experience with this employer	➲ **2**
Title	Water Resource Engineer	Years of relevant experience with other employer(s)	➲ **7**
Degree(s) / Years / Specialization		Ph.D. / 2014 / Civil Engineering (Water Resources), Auburn University M.S.E. / 2012 / Civil Engineering (Water Resources), Auburn University B.E. / 2007 / Civil Engineering, Tribhuvan University, Pulchowk Campus	
Active registration number / state / expiration date		129638 / Louisiana / 09/30/2023 3971-21N / Certified Floodplain Manager, Texas / 05/27/2022	
Year registered	2018 (PE) | 2021 (CFM)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Hydrology & Hydraulics Support**	

Dr. KC is a water resources engineer with diverse experience in applied surface water, H&H modeling research, civil and hydraulic engineering design, research experience in hydrogeomorphology, ecosystem and climate modeling. He has published several technical papers in peer-reviewed journals. His previous experiences include modeling for H&H Studies using HEC-HMS/HEC-RAS, FLO-2-D, TR-55, TR-20, StormCAD, XPSWMM, and ArcGIS, Dr. KC is also experienced in statistical analysis of large datasets; LiDAR point cloud pre/post processing; and programming using R, Visual Basic, Python, NCL, and Bash. Dr. KC excels at developing scripts to expedite the development of input data for HEC-HMS and HEC-RAS models. He has performed cloud based HEC-RAS modeling to expedite run times and impact analyses, as he did for a 200-mile 2-D model along the Rio Grande and delivered the completed study to USACE within schedule.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
11/20 – 05/23 (Estimated)	**Louisiana Watershed Initiative Modeling Contract - Region 6, LA.** *DOTD.* Water Resources Engineer. Responsible for providing support for the data collection and analysis of hydraulic datasets, models, and studies; and proposition of modeling design approaches for 4 HUC's of Region 6 for Louisiana Watershed Initiative (LWI). Michael Baker is providing engineering and modeling services to the DOTD for Region 6 for the Louisiana Watershed Initiative (LWI). The LWI project was launched in 2018 and introduced a watershed-based approach to reducing flood risk in Louisiana. It is organized by seven modeling regions, each of which encompasses multiple HUC-8 watersheds. For the first task order of the contract, Michael Baker will collect existing watershed datasets, models, and studies, develop and propose a detailed modeling design approach with schedules and cost estimates, and prepare a data gap analysis and collection report.
06/19 – 07/21	**Programmatic Floodplain Modeling Impact Analysis Programs Support, Laredo, TX.** *USACE, Fort Worth District.* Water Resources Engineer. Responsible for hydraulic modeling to assess the impacts of proposed wall projects and to ensure that the U.S. Section of the International Boundary and Water Commission (USIBWC) criteria on no adverse impact can be met. An 80 miles complex 1-D/2-D riverine HEC-RAS model was developed for the impact assessment of fence/wall on the Rio Grande River which included H&H analysis, QC, floodplain analysis, and report. Created novel solutions for modeling which expedited project schedule and improved model accuracy.
05/19 – 02/21	**Laredo and Rio Grande H&H Analysis, Webb County, TX.** *USACE, Fort Worth District.* Water Resources Engineer. Responsible for hydraulic modeling for the assessment of the impacts of the proposed wall projects and to ensure that USIBWC criteria can be met. A complex 1-D/2-D HEC-RAS model of 150 miles long riverine model with more than 140 miles of proposed wall is being used for the assessment of fence/wall on both the Rio Grande River and its floodplain.
10/19 – 11/19	**Vince Bayou Watershed Planning Project, Harris County, TX.** *HCFCD.* Water Resources Engineer. Responsible for the development of a high-level watershed master plan for the Vince Bayou watershed for CDBG Funding of 15MM. Developed rain-on-grid analyses and 1-D/2-D coupled models with NOAA Atlas 14 precipitation estimates for nine streams and seven tributaries, totaling approximately 21.3 miles to identify flood-prone areas. Prioritized problem areas and developed targeted mitigation alternatives and performed benefit-cost analysis for each alternative prioritizing projects with the best score and lowest environmental constraint.
01/21 – 12/21	**Subsidence Impacts on Spring Creek Watershed, Harris and Montgomery Counties, TX**. *HGSD*. Senior Engineer. Mr. KC incorporated subsidence into the 1-D/2-D models and developed impact analyses to reflect how subsidence will impact flood risk and infrastructure replacement costs in the watershed. Michael Baker is providing engineering services to evaluate the projected increases in flood risks and economic impacts of subsidence associated with multiple scenarios of groundwater withdrawal in the Spring Creek watershed. Michael Baker is providing data collection and analysis, developing H&H modeling for multiple subsidence scenarios, quantifying impacts, and preparing documentation for the study.
06/19 – 05/22	**Indefinite Delivery Indefinite Delivery Contract, TX.** *USACE, Fort Worth District.* Water Resources Engineer. Responsible for hydraulic modeling for the assessment the impacts of the proposed wall projects and to ensure that the USIBWC criteria can be met. Those criteria state that the design flood Water Surface Elevations (WSE), in

	proposed conditions, shall not increase more than 6-inches in rural areas or 3-inches in urban areas when compared to the existing floodplain conditions (existing condition with no wall) and have no more than a 5% increase in flow deflection. The model named as RGV-63 spans from the outlet of Falcon Dam to Penitas (RGV07-RGV08-RGV09), along USBP Zones 1 through 5 was modeled for the impact analysis of the 63-miles of proposed bollard wall along the Rio Grande from Falcon Dam to Penitas in Texas. A complex 1-D/2-D HEC-RAS model of 90 miles long 1-D riverine model integrated with 186 square miles 2-D Model with 63 miles of proposed wall is being used for the assessment of fence/wall on both the Rio Grande River and its floodplain.
06/21 – 08/21	**Placer County Flood Risk Project, Auburn, CA.** *Placer County Flood Control and Water Conservation.* Water Resources Engineer. Responsible for guiding the development of 1D/2D HEC-RAS models for 11 mile stretch of Markham Ravine. The objective of this Flood Risk Project is to support development and finalization of select Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) reports for Placer County. Five new detailed studies for the watersheds of Coon Creek, Doty Ravine, Blackwood Creek, Tahoe Vista Creek and Griff Creek will be prepared while existing, effective detailed studies for six other watersheds (including South Branch Pleasant Grove Creek, Secret Ravine Upper Fork/Loomis Tributary, Dry Creek, Cirby Creek, Linda Creek and Markham Ravine) will be revised and finalized. Letter of Map Revision (LOMR) applications will also be incorporated, if available.
07/19 – 07/19	**Cypress Regional Drainage Plan, Harris County, TX.** *Harris County Flood Control District.* Water Resources Engineer. Responsible for reviewing 1D and 2D unsteady HEC-RAS models for different sub-watersheds of Cypress Creek Watershed. Michael Baker updated a drainage master plan for Cypress Creek tributary watersheds in northwest Harris County and expanded it to include Cypress Creek. As part of this fast-paced project, Michael Baker harnessed advances in modeling capabilities and more recent LiDAR and rainfall data to update a study prepared in 2003 for all Cypress Creek Tributary watersheds, except for Little Cypress Creek. Michael Baker studied 17 streams in the eight tributary watersheds to evaluate feasible flood mitigation alternatives and recommended mitigation plans that can be advanced to design. It also evaluated the effectiveness of large regional detention ponds along 27 miles of Cypress Creek at Eldridge Parkway and at Stuebner Airline Road. Michael Baker's tasks included data collection, review, structure inventory updating, and a site visit; developing revised existing and future hydrologic and hydraulic models; developing drainage plans; performing an EA; natural channel design (NCD); and project coordination and meetings.

Firm employed by **Michael Baker**			
Name	**Donald Gregor, PE**	Years of relevant experience with this employer	➲ **14**
Title	Civil Engineer	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		B.S. / 2007 / Civil Engineering, University of Pittsburgh	
Active registration number / state / expiration date		PE080657 / Professional Engineer - Civil, Pennsylvania / 09/20/2023	
Year registered	2012	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Hydrology & Hydraulics Support**	

Mr. Gregor will support the Hydrology and Hydraulics analysis and design including the updating the probable maximum precipitation analysis, design storm event determination, spillway design, flood routing and dam breach analyses. Mr. Gregor is a Water Resources Engineer experienced in hydrologic and hydraulic computer modeling, spillway and hydraulic structure rehabilitation and design, inundation mapping, and development of Emergency Action Plans. Mr. Gregor has performed H&H analyses for Donegal and Chapman Dam as well as leading the dam breach analysis for 7 PFBC dams, George B. Stevenson and multiple other dams for PADCNR and ODNR.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
01/17 – 12/18	**Dam Breach Modeling-Fords Pond & Stevens Lake, Lackawanna and Wyoming County, PA.** *Pennsylvania Fish and Boat Commission*. Hydrologic and Hydraulic Engineer. Michael Baker performed a dam breach analysis for Fords Pond and Stevens Lake dams for the Pennsylvania Fish and Boat Commission. This project included; performing a review of current PADEP HEC-1 model and findings; preparing hydrologic analysis of the watershed to the dams as well as the contributing tributary watersheds within the flood inundation limits; and preparing a hydraulic model of Fords Pond and Stevens Lake dams, adjacent roadways, roadway crossing structures, and receiving floodplains for the purposes of analyzing the effects of the dam breaches with respect to design storm event and flooding at the downstream residences.
10/16 – Current	**Pennsylvania DCNR Dam Safety Projects, Various locations, PA.** *DCNR.* Water Resources Engineer. Responsible for the hydrologic and hydraulic dam break analysis and flood inundation mapping that PA DCNR used for master planning efforts at Laurel Mountain State Park in Ligonier Township, Westmoreland County, Pennsylvania. Michael Baker's is providing dam inspection and assessment, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection to assist the client with implementing its dam safety program. Projects under this contract include Little Buffalo Dam inspection, Pymatuning Dam, Raccoon Creek Dam, Laurel Mountain State Park Water Supply Dams, Lackawanna State Park - Trostle Pond Dam, and Laurel Hill State Park - Penn Scenic View Lake Dam.
06/16 – 01/17	**Walker Lake and Mauch Chunk Lake Dams Hydrologic and Hydraulic Modeling, Carbon and Snyder Counties, PA.** *Pennsylvania Fish and Boat Commission.* Water Resources Engineer. Responsible for the hydrologic and hydraulic dam break analysis and flood inundation mapping that PFBC used for emergency action planning efforts. Michael Baker performed a hydrologic and hydraulic dam break analysis using state-of-the-art modeling programs and geographic information system technology to produce an accurate and reliable model of Walker Lake and Mauch Chunk Lake dams. Michael Baker prepared inundation mapping using site survey and Pennsylvania Spatial Data Access LiDAR to create a three-dimensional model of the flooding limits, aiding in public safety and future dam rehabilitation efforts. Michael Baker coordinated with regulatory agencies to fast-track the model review and approval.
01/21 – 12/25 (Estimated)	**Rehabilitation of Five Pennsylvania Dams, Various Locations, PA.** *Pennsylvania Fish & Boat Commission.* Civil Associate. Assisted with the development of hydrologic and hydraulic analysis. GIS mapping and support related to the hydrologic and hydraulic analysis. Michael Baker is providing engineering services to bring five dams into compliance with Pennsylvania Department of Environmental Protection regulations. Michael Baker's services include dam inspections, hydrologic and hydraulic evaluations, geotechnical investigations, structural assessments, alternatives analyses, dam-break modeling, inundation mapping, permitting, agency coordination, and construction services.
03/15 – 08/18	**Somerset Lake Dam Renovations, Somerset Township, PA.** *Pennsylvania Fish and Boat Commission.* Water Resources Engineer. Responsible for development of hydrologic and hydraulic analysis including a Labyrinth Spillway. Also aided in the design of the Labyrinth Spillway and energy dissipator. Michael Baker is providing engineering services for the Somerset Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PFBC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations. Somerset Lake Dam was constructed in 1956 and creates Somerset Lake, which is a heavily used recreational facility. Michael Baker's tasks include reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic

	analysis; performing a topographical survey, geotechnical investigation, and structural analysis to evaluate current conditions; identifying and analyzing rehabilitation alternatives; and providing construction management services.
06/15 – 01/18	**Lake Loramie Dam Rehabilitation, Shelby County, OH.** *Ohio Department of Natural Resources.* Water Resources Engineer. Led the development of the Lake Loramie Dam Emergency Action Plan (EAP). The EAP was based on an unsteady HEC-RAS analysis of the dam breach. Flood mapping was done using ArcGIS. Michael Baker provided engineering services for the rehabilitation of Lake Loramie Dam as an interim risk reduction (IRR) project. The existing spillway has exhibited severe structural deterioration and was replaced with a labyrinth spillway adjacent to the existing spillway. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, rehabilitation design, and construction management and inspection services. The improvements to the dam included select partial dam removal, embankment construction (including drainage filters), construction of labyrinth spillway, stilling basin, bank floodwall, control tower, placement of a pedestrian bridge over the spillway, and site upgrades to the immediate dam area. Normal pool was maintained throughout construction to limit the impact to the park, homeowners, and businesses surrounding the lake. The rehabilitations were completed as part of an IRR project due to the unsatisfactory structural condition of the existing spillway.
05/12 – 01/19	**Rehabilitation of Donegal Lake Dam, Donegal Township, PA.** *Pennsylvania Fish and Boat Commission.* Civil Associate. Assisted with the development of hydrologic and hydraulic analysis relating to dam rehabilitation. Michael Baker provided engineering services for rehabilitation of the Donegal Lake Dam to ensure compliance with Pennsylvania Department of Environmental Protection regulations for spillway capacity and overtopping protection during the design event. Donegal Lake Dam, located in Westmoreland County, Pennsylvania, is owned by the Pennsylvania Fish and Boat Commission. The dam was constructed in 1967 and creates Donegal Lake, which is a heavily used recreational facility. Michael Baker's tasks included reviewing existing drawings and reports; performing a field assessment, hydrologic and hydraulic analysis, topographical survey, and subsurface investigation to evaluate the current condition of the dam; identifying and screening alternatives and developing remediation designs and cost estimates; and providing construction oversight.
03/12 – 09/12	**Rehabilitation of Flat Top Lake Dam, Ghent, WV.** *Flat Top Lake Association, Inc..* Civil Associate. Assisted with the development of hydrologic and hydraulic analysis relating to dam rehabilitation. Michael Baker provided engineering services for rehabilitation of the Flat Top Lake Dam to ensure compliance with West Virginia Department of Environmental Protection regulations regarding spillway capacity and overtopping protection as the dam could not convey the design event. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing hydrologic and hydraulic analyses; performing topographical surveys and geotechnical investigations to evaluate current conditions; identifying and analyzing rehabilitation alternatives; and providing construction management services.
12/11 - -5/12	**Pike Lake Dam Rehabilitation, Pike County, OH.** *Ohio Department of Natural Resources.* Civil Associate. Assisted with the development of hydrologic and hydraulic analysis relating to dam rehabilitation. Michael Baker provided engineering services for rehabilitation of the Pike Lake Dam to ensure compliance with the department's dam safety regulations with regard to overtopping protection during the design event and spillway capacity. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, alternatives identification and evaluation, rehabilitation design, and construction administration and inspection.
12/12 – 02/14	**Dam Rehabilitations, Scioto, Pike, and Vinton Counties, OH.** *Ohio Department of Natural Resources.* Civil Associate. Assisted with the development of hydrologic and hydraulic analysis relating to dam rehabilitation. Michael Baker is providing engineering services for the rehabilitation of several dams to bring them into compliance with current state safety regulations. Michael Baker's services include dam inspection, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection.
12/11 – 09/12	**Roosevelt Lake Dam Rehabilitation, Scioto County, OH.** *Ohio Department of Natural Resources.* Civil Associate. Assisted with the development of hydrologic and hydraulic analysis relating to dam rehabilitation. Responsible for construction management and inspection. Michael Baker provided engineering services for the rehabilitation of the Roosevelt Lake Dam to ensure compliance with the department's dam safety regulations with regard to overtopping protection during the design event and spillway capacity. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, alternatives identification and evaluation, rehabilitation design, and construction management and inspection.

Firm employed by **Michael Baker**			
Name	**Christopher "Chris" Tagert, PE, CFM**	Years of relevant experience with this employer	➲ **17**
Title	Water Resource Engineer	Years of relevant experience with other employer(s)	➲ **8**
Degree(s) / Years / Specialization		B.S. / 1996 / Civil Engineering/Environmental Engineering, Pennsylvania State University	
Active registration number / state / expiration date		Certified Floodplain Manager / Nationwide / US-01-003322001 PE 38278 / Colorado / 10/31/2023	
Year registered	2004 (PE) | 2001 (CFM)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 6d. Dam Analysis and Design**	

Mr. Tagert, as Michael Baker's water resource lead in Colorado, has extensive experience reviewing flood ordinances related to local land use, including assessing and providing flood ordinance recommendations to the Southeast Metro Stormwater Authority and City of Lincoln, Nebraska, and contributing to the re-write of the Land Use Code in Boulder County, Colorado, as part of his work on the 2013 Flood Recovery project. He has led recovery efforts for many natural disasters throughout his career. Mr. Tagert was the Project Manager for Michael Baker's comprehensive response and recovery work in Boulder County in response to the September 2013 floods. In this role he oversaw field assessments, analysis of county-wide flood risks, identification/prioritization of recovery projects (including aggradation remediation plans), outreach and other public meetings, on-site staffing support, and implementation of flood recovery projects. Mr. Tagert has experience in program management, water resources engineering, and response to natural disasters. Chris managed the production of FEMA Flood Studies for Michael Baker's Denver office during Map Modernization and Risk MAP. In this role, Mr. Tagert scoped, scheduled, and budgeted over 20 projects each year. His foundational background includes floodplain modeling and analysis for riverine and coastal hazards, stormwater design, master planning, stream restoration, urban drainage design, development of customized GIS and other technology solutions, and an emphasis on the communication and outreach. Mr. Tagert has managed subcontractors and stakeholders on municipal and federal contracts for over a decade, managing on-average over $8M in annual contract value during Risk MAP, and understands how to tailor project coordination and delivery.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
03/09 – 04/12	**On-Call Floodplain Management Services Contract, Centennial, Colorado.** *Southeast Metro Stormwater Authority (SEMSWA).* Project Manager. Responsible for the analysis of existing CRS programs, creating the evaluation methodology for current and potential future CRS performance, and preparation of CRS applications for two municipalities. Michael Baker provided on-call engineering services under the second consecutive floodplain management services agreement. Michael Baker's services included National Flood Insurance Program Municipal Community Rating System evaluations, a city land development code assessment, and development of a comprehensive public outreach plan to raise flood risk awareness.
10/04 – 09/14	**Regional Task Orders for the Flood Map Modernization Program, Nationwide.** *FEMA.* Production Supervisor. Responsibilities include ad-hoc consulting. Michael Baker is performing various tasks leading to the development of digital flood insurance rate maps (DFIRM) and supporting the Map Modernization program in all 10 FEMA Regions. Support tasks include maintenance and management of the web-based Mapping Information Portal (MIP), outreach, cooperating technical partner coordination, coastal guideline and specification updates, technical assistance, project monitoring, support and attendance at conferences, training, post-preliminary support, physical map revisions, floodplain boundary standard documentation, levee research and database support, and other general technical support.
10/12 – 08/15	**Countywide Digital Flood Insurance Rate Map Conversion and Floodplain Remapping, Sweet Grass County, Montana.** *Montana Department of Natural Resources and Conservation.* Production Supervisor. Responsible for programmatic oversight. Michael Baker provided professional services as needed to complete a Digital Flood Insurance Rate Map (DFIRM) conversion. Michael Baker incorporated existing data studies (including a U.S. Army Corps of Engineers study for the entire reach of the Yellowstone River), converted paper floodplain mapping into a GIS-based digital format, incorporated Letters of Map Change (LOMC), and re-delineated floodplain boundaries using better topographic data. Michael Baker performed field surveys, collected and developed topographic data, and acquired base maps; reviewed hydrologic and hydraulic data for existing data studies; developed floodplain mapping; produced the DFIRM database; developed and distributed preliminary map products; and provided post-processing services, including facilitation of community meetings.
09/11 – 11/15	**Risk MAP Regional Technical Support, Arkansas, Louisiana, Oklahoma, New Mexico, and, Texas.** *U.S. Federal Emergency Management Agency (FEMA), Region VI.* Production Supervisor. Responsible for programmatic oversight. Michael Baker is providing production and technical services support to the agency's headquarters and Regions IV, VI, VIII, and IX under the Risk Mapping, Assessment, and Planning Program. Michael Baker's services include technical support for Texas and Louisiana coastal studies, appeal resolution for a preliminary map revision, preliminary digital flood insurance rate map and flood insurance study printing and distribution for 16 Texas coastal studies, and post-preliminary processing for 47 flood insurance studies.
12/13 – 12/17	**Flood Recovery Planning and Implementation, Boulder County, Colorado.** *Boulder County, Colorado Purchasing.* Project Manager. Responsible for managing floodplain consulting services, including resource allocation, quality, and client satisfaction. Michael Baker provided onsite support, planning, and flood recovery services

	in response to the September 2013 floods, supporting the county's Floodplain Permitting and Comprehensive Creek Planning programs. Through onsite floodplain permitting work, Michael Baker reviewed and provided assessments of proposed flood recovery projects throughout the county and participated in discussions on policy implementation and development for the on-the-ground conditions created in the aftermath of the floods. Michael Baker also supported the Comprehensive Creek Planning initiative, including facilitating kickoff meetings attended by more than 650 residents; evaluating more than 3,000 reported damage points; and performing field assessments on over 90 miles of creeks, resulting in the identification of more than 200 high hazard sites throughout the county. Michael Baker developed implementation plans for each creek within the county, identifying on a reach-by-reach basis the projects that will be implemented to reduce the risk of flooding or damage to homes and infrastructure due to spring runoff and summer rainfall seasons.

Firm employed by **Michael Baker**			
Name	**Mujahid Chandoo, PE**	Years of relevant experience with this employer	➲ **15**
Title	Water Resource Engineer	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		B.S. / 2006 / Civil Engineering, California State University at Fullerton A.S. / 2003 / Mathematics, Fullerton College	
Active registration number / state / expiration date		PE.0044045 / Louisiana / 03/31/2022	
Year registered	2019	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Dam Analysis and Design Support**	

Mr. Chandoo has extensive experience in surface water management projects. His areas of expertise include hydrology, hydraulics, sediment transport and advanced modeling. He has been involved with a variety of projects including, but not limited to, complex watershed and drainage master planning throughout California, storm drain and channel design, bridge hydraulic studies, and commercial and residential site improvements, Floodplain Management and FEMA Mapping, dam inundation studies, sediment transport modeling, environmental documentation, and large scale 2-dimensional floodplain studies. His computer modeling background includes the application of the Army Corps of Engineers HEC-RAS (River Analysis System) 1D/2D, HEC-FFA, HEC-HMS, Flo-2D. TR-55, Stormwater and Wastewater Management Model (XP-SWMM), PCSWMM, EPA SWMM, Bentley CivilStorm, Watershed Modeling System (WMS) and Advanced Engineering Software (AES) for hydrologic/hydraulic analysis in Southern California, Sediment Transport models include HEC-6T, and SAM. Mr. Chandoo uses the Geographical Information System (GIS) hydro applications in most of the hydrology and hydraulics software's. Mr. Chandoo has performed work, lead and managed projects for public and private sector clients ranging in complexity from small scale technical drainage studies to large public works projects, including planning, permitting, and coordination with federal, state, and local entities. He also delivered the presentation, "3D Flood Wave Animations for Emergency Action Planning" for the Association of State Dam Safety Officials (ASDSO) in New Orleans, LA.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, “designed drainage”, “designed girders”, “designed intersection”, etc. Experience dates should cover the time specified in the applicable MPR(s).
10/11 - 09/13 -	**Riverside North Aquifer and Storage Recovery Project, Riverside and, San Bernardino Counties, CA.** *City of Riverside.* Engineer. Responsible for preliminary design and environmental clearance for a rubber dam diversion on the Santa Ana River for the purposes of groundwater recharge. The project included both in channel and offline recharge basins for replenishment of the Rialto-Colton and Riverside-Arlington Groundwater Basins. A portion of the project included a tie-in to the state water project line as a method for recharging groundwater when native water is not available. The project also involved the preparation of an EIR. Michael Baker prepared an environmental impact report and provided topographic mapping and conceptual engineering support for the Riverside Groundwater Aquifer Storage and Recovery Project, to provide groundwater recharge facilities along the Santa Ana River.
03/15 - 04/19	**Stafford Dam Emergency Action Plan, Novato, CA.** *North Marin Water District.* Engineer. Responsible for hydrology and hydraulics analysis. Michael Baker performed dam breach scenario hydrology and hydraulic (H&H) modeling, GIS-based flood inundation mapping, emergency action plan (EAP) development, and an emergency response tabletop exercise facilitation for Stafford Dam. The client owns and operates the dam for water distribution and flood control; its failure would impact tens of thousands of residents and their homes as well as hundreds of businesses and public facilities. The dam failure inundation study used two-dimensional modeling to determine the potential areas of inundation and identify the time at which the floodwave would arrive after the dam failure. Additionally, a tabletop exercise of a simulated dam failure was conducted to collaborate with and train client staff and local first responders from stakeholder agencies to prepare for the unlikely event of failure.
09/14 - 10/15	**Whittier Narrows Dam, Los Angeles County, CA.** *RVA Corporation.* Project Engineer. Responsible for the dam operational considerations for both Water Replenishment District of Southern California and Los Angeles County Department of Public Works. Responsibilities included developing a HEC-RES SIM (reservoir simulation model) from the existing ACOE HEC-5 and including expanding stream flow record. The main objective of the studies was to increase groundwater recharge within Los Angeles County. Alternative analysis was performed to determine short-term and long-term benefits by changing the operations of the dam. Economic analysis was performed, including improvements to the dam, maintenance, and potential loss to recreation.
10/12 – 01/16	**Greenspot - Highland, Highland, CA.** *LCD Greenspot, LLC.* Engineer. Responsible for hydrology and hydraulics analysis. Michael Baker provided civil engineering services for the development of the 1,658-acre "Greenspot" property in the City of Highland in San Bernardino County. The property had originally been acquired as a borrow site for soils material needed during the construction of the Seven Oaks Dam as part of the Santa Ana River Project. The property was slated for a master planned community and the county required approval of a specific plan, preliminary engineering, and related environmental studies to obtain the highest and best use.

Firm employed by **Michael Baker**			
Name	**Joe Kudritz, PE**	Years of relevant experience with this employer	**➲ 13**
Title	Civil Engineer	Years of relevant experience with other employer(s)	**➲ 0**
Degree(s) / Years / Specialization		Graduate Studies, Water Resources and Environmental Engineering, University of Pittsburgh B.S. / 2007 / Civil Engineering, Geneva College	
Active registration number / state / expiration date		PE080657 / Professional Engineer - Civil, Pennsylvania / 09/30/2023	
Year registered	2013	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Dam Analysis and Design Support**	

Mr. Kudritz will serve as the Hydrology and Hydraulics Lead and will be responsible for establishing hydraulic design criteria and designing hydraulic modifications. Mr. Kudritz is a Water Resources Engineer experienced in hydrologic and hydraulic computer modeling and design for dams and other hydraulic structures. He has performed an integral role in a variety of dam rehabilitations and has lead or supported the hydrology and hydraulics analysis and design for PFBC dams, PADCNR dams, Lake Loramie, Mount Gilead, Blue Rock, Stewart Lake, Knox Lake, and other projects. Mr. Kudritz is well versed in all aspects of dam rehabilitation, rehabilitation designs, and dam safety inspections. Mr. Kudritz has also been active with Association of State Dam Safety Officials (ASDSO) and presented and authored technical proceedings for the 2017, 2018, and 2019 National Conferences. In 2017, Mr. Kudritz presented on proper waterstop design, selection, and installation aimed at maintaining the integrity of water retaining structures. In the same year, Mr. Kudritz coauthored a presentation on 3-D modeling techniques that provide visualization tools and increase clarity for the owner, public, and major stakeholders.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
12/18 – 05/22 (Estimated)	**Knox Dam Improvements, OH.** *Ohio Department of Natural Resources.* Technical Lead. Responsible for the overall technical direction of the project. Specific tasks included updating the H&H analyses, summarizing the results in the study and verification report, and coordinating the analyses performed by the structural and geotechnical disciplines. During the final design stages, oversaw the design of the spillway rehabilitation and developed construction documents, participated in multiple with coordination meetings with the CMR contractor and assisted with the transition to the new contractor. Involved through construction and has reviewed construction submittals, reviewed RFIs, and performed site inspections.
10/15 – 10/18	**Mount Gilead Lake Upper and Lower Dam Rehabilitation, OH.** *Ohio Department of Natural Resources*. Project Design Lead and Hydrologic and Hydraulic Lead. Responsible for leading the design of Mount Gilead Dam DGS C-199-60,61,62,63,64 Phase 001 Multiple Locations – Dam Rehabilitation Project replacement and overseeing the hydraulic and hydrologic analysis for the existing and proposed dam. The labyrinth spillway, the first of this type to be designed and to be constructed in Ohio, has been designed to conform to published guidance documents and model studies. The spillway was designed utilizing flows developed precipitations from the Statewide PMP Study. Mr. Kudritz also oversaw the updated Emergency Action Plan (EAP) for the new dam. Mr. Kudritz prepared preliminary and final construction drawings, incorporated all structural and geotechnical aspects of the dam construction, and developed conceptual construction sequencing and phasing plans.
12/14 – 05/15	**Lake Loramie Dam Rehabilitation, OH.** *Ohio Department of Natural Resources*. Project Design Lead and Hydrologic and Hydraulic Lead. Responsible for leading the design of Lake Loramie Dam replacement and overseeing the hydraulic and hydrologic analysis for the existing and proposed dam. The labyrinth spillway to mimic existing flows up to the 100-year design event while providing additional capacity to convey the PMF event. Mr. Kudritz also oversaw the development of the updated EAP. Due to site constraints, the replacement spillway was designed adjacent to the existing structure and phased to maintain normal pool throughout construction. Mr. Kudritz oversaw the development of final construction drawings, which incorporated all structural and geotechnical aspects of the dam construction and developed conceptual construction sequencing and phasing plans.
03/16 – 12/18	**Blue Rock State Park Cutler Dam Rehabilitation, OH.** *Ohio Department of Natural Resources*. Project Design Lead and Hydrologic and Hydraulic Lead. Responsible for overseeing the design of dam replacement and performing the hydraulic and hydrologic analysis for the existing and proposed dam. The labyrinth spillway was designed to mimic existing flows up to the 100-year design event while providing additional capacity to convey the PMF event without overtopping the embankment. Mr. Kudritz also oversaw the development of the updated EAP. The replacement spillway design considered various site constraints including the close proximity to an active sanitary treatment plant and active water and electric utility lines below the spillway. Mr. Kudritz oversaw the development of final construction drawings, which incorporated all structural and geotechnical aspects of the dam construction and developed conceptual construction sequencing and phasing plans.

10/17 – 04/22	**Hinckley Lake Dam Modifications, OH.** *Cleveland Metroparks*. Project Design Lead and Hydrologic and Hydraulic Lead. Responsible for overseeing the design of dam rehabilitation and performing the hydraulic and hydrologic analysis for the existing and proposed dam. The preliminary design is complete with the client electing to pursue stabilizing the existing spillway by adding mass concrete and containing the PMF by raising the earthen embankment. Mr. Kudritz will oversee the development of final construction drawings once final design commences.
03/15 – 12/25 (Estimated)	**Somerset Lake Dam Renovations, Somerset Township, PA.** *Pennsylvania Fish and Boat Commission.* Civil Engineer. Responsible for overseeing the H&H analysis of Somerset Lake and for leading the design of the replacement labyrinth spillway. Other responsibilities included task manager for the preparation of construction documents and overseeing construction administrations tasks. Involved in the design submission meetings with the client and dam safety and has provided construction administration services that included review of construction submittals and response to RFIs. Michael Baker is providing engineering services for the Somerset Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PFBC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations. Somerset Lake Dam was constructed in 1956 and creates Somerset Lake, which is a heavily used recreational facility. Michael Baker's tasks include reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic analysis; performing a topographical survey, geotechnical investigation, and structural analysis to evaluate current conditions; identifying and analyzing rehabilitation alternatives; and providing construction management services.
09/16 – 09/17	**Lakeview Dam Redevelopment, Bridgeville, PA.** *Lakeview Christian Life Church.* Project Manager. Responsible for the removal of the existing dam and redevelopment of the former lake area. Coordinated the various design and permitting leads, oversaw the technical design, finalized the construction documents (drawings and specifications), assisted the client with the selection of a suitable contractor, and provided construction administration services.
09/17 – 11/18	**Stewart Lake Dam Modifications, Chillicothe, OH.** *Ohio Department of Natural Resources.* Civil Engineer. In collaboration with the design team, performed an inspection and assessment of Stewart Lake Dam and developed a Preliminary Evaluation Report. Served as the Hydrologic and Hydraulic lead and was responsible for analyzing the hydraulic capacity of the existing structure and determining the impacts to the downstream inhabitants after the dam was breached. Served as the technical design lead to develop dam removal construction documents. Michael Baker provided engineering services to evaluate Stewart Lake Dam and to provide options to remedy deficiencies identified during past dam inspections, which included the breaching of Stewart Lake Dam. The results of the evaluations and remedial options were summarized in an Alternative Evaluation Report that was submitted to the client for review. Additional services include hydrologic and hydraulic analyses and permitting assistance.
01/21 – 12/25 (Estimated)	**Rehabilitation of Five Pennsylvania Dams, Various Locations, PA.** *Pennsylvania Fish & Boat Commission.* Project Manager. Leading the development of hydrologic and hydraulic analysis. GIS mapping and development of design alternatives. Michael Baker is providing engineering services to bring five dams into compliance with Pennsylvania Department of Environmental Protection regulations. Michael Baker's services include dam inspections, hydrologic and hydraulic evaluations, geotechnical investigations, structural assessments, alternatives analyses, dam-break modeling, inundation mapping, permitting, agency coordination, and construction services.

Firm employed by **Michael Baker**			
Name	**Brian Afek, PE**	Years of relevant experience with this employer	➲ **8**
Title	Department Manager	Years of relevant experience with other employer(s)	➲ **14**
Degree(s) / Years / Specialization		B.S. / 2006 / Civil Engineering/Geotechnical Engineering, The Ohio State University	
Active registration number / state / expiration date		PE083439 / Professional Engineer, Pennsylvania / 09/30/2023	
Year registered	2015	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Dam Analysis and Design Support**	

Mr. Afek is experienced in water resource engineering, geotechnical engineering, construction management, and project management. He is well versed in the inspection, assessment, and design of dams and levees and is well qualified to support design projects in cases where geotechnical and general civil engineering studies are required. In addition to dams, Mr. Afek has an extensive background in foundation design, roadway analysis, and construction monitoring and testing. He has performed as a certified professional engineer, testing technician, inspector, field driller assistant, field supervisor, laboratory supervisor, and project manager over the course of his career. With this broad experience, he is also qualified to support field investigations and manage projects from preliminary design to construction. Mr. Afek is a member of the Association of State Dam Safety Officials (ASDSO) and the Ohio Dam Safety Organization (ODSO).

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
10/17 – 12/17	**Hinckley Lake Dam Modifications, Hinckley, OH.** *Cleveland Metroparks.* Project Manager. Responsible for management of the project for preliminary design. Management responsibilities included budget, schedule, coordination, task management, permitting, preliminary design, presentations to the client and other agencies, public meetings, and field services supervision. The Hinckley Lake Dam Improvements project included providing a design with the most cost effective solution, maintaining the look of the existing spillway, incorporating the overall park into the design considerations, and meeting an expedited schedule. Michael Baker is providing engineering services to design modifications for Hinckley Lake Dam to ensure compliance with ODNR Dam Safety Regulations. The dam, in its current configuration, does not have adequate capacity to convey the Probable Maximum Flood design event over the spillway without overtopping the dam. Michael Baker is providing professional services to rehabilitate and modify the dam to meet ODNR regulations. These services include site investigation and assessment, hydrologic and hydraulic analysis, geotechnical analyses and assessment, alternatives evaluation, permitting, and rehabilitation design.
11/18 – 05/22 (Estimated)	**Knox Dam Improvements, OH.** *Ohio Department of Natural Resources.* Project Manager. Responsible for acceptance of all parts of the design and management of the project from start to finish, including budget, schedule, coordination, task management, permitting, final design (future), and construction management (future). Also responsible for working closely with ODNR to successfully meet the client demands while staying under budget and on schedule.
06/13 – 06/13	**Dutch Fork Lake Dam Condition Assessment and Rehabilitation Design, Donegal Township, Washington County, PA.** *Pennsylvania Fish and Boat Commission.* Civil Engineer. Responsible for the review of construction documents and development of details and specifications. Michael Baker provided engineering services for rehabilitation of the Dutch Fork Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PBFC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Dutch Fork Lake Dam was constructed in 1959 and creates Dutch Fork Lake, which was a heavily used recreational facility until PFBC breached the dam in 2005 after damage to the spillway occurred during Hurricane Ivan. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing hydrologic and hydraulic analyses; performing topographical surveys and geotechnical investigations to evaluate current conditions; identifying and analyzing rehabilitation alternatives; developing designs; and providing construction management services.
08/15 – 11/19	**Mount Gilead Dam Improvements, Mount Gilead, OH.** *Ohio Department of Natural Resources.* Project Manager. Responsible for full management of the project including budget, schedule, coordination, task management, permitting, final design, and construction management. Played a key role in the design and analysis of ODNR's first labyrinth in a state park. During construction, worked directly with the contractor to resolve issues or questions in the field which kept change orders to a minimum for the project and allowed the owner to reallocate the remaining budget for other park improvements. Michael Baker provided engineering services for the rehabilitation of Mount Gilead Lake upper and lower dams to ensure compliance with Ohio Department of Natural Resources' Dam Safety Regulations regarding spillway capacity. Based on the analyses performed on the lower dam, the existing spillway had inadequate capacity to convey the Probable Maximum Flood design flood without overtopping the embankment. Services included site and geotechnical investigations, hydrologic and hydraulic analyses, permitting, dam inspection, preliminary design analyses and rehabilitation recommendations, rehabilitation designs, and construction management and inspection services.
12/14 – 05/15	**Lake Loramie Dam Rehabilitation, Shelby County, OH.** *Ohio Department of Natural Resources.* Project Manager. Responsible for management of the project from final design to construction management. Management responsibilities included budget, schedule, coordination, task management, permitting, final design, presentations

	to the client and other agencies, public meetings, and construction management. The Lake Loramie Dam Improvements project presented many design challenges including: designing a spillway while maintaining lake level, designing a spillway that can mimic the existing hydraulic characteristics as closely as possible, minimal area for construction due to close property boundaries and environmental impacts, and an expedited schedule that required multiple agencies to cooperate in order to meet expectations. Michael Baker provided engineering services for the rehabilitation of Lake Loramie Dam as an interim risk reduction (IRR) project. The existing spillway has exhibited severe structural deterioration and was replaced with a labyrinth spillway adjacent to the existing spillway. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, rehabilitation design, and construction management and inspection services. The improvements to the dam included select partial dam removal, embankment construction (including drainage filters), construction of labyrinth spillway, stilling basin, bank floodwall, control tower, placement of a pedestrian bridge over the spillway, and site upgrades to the immediate dam area. Normal pool was maintained throughout construction to limit the impact to the park, homeowners, and businesses surrounding the lake. The rehabilitations were completed as part of an IRR project due to the unsatisfactory structural condition of the existing spillway.
10/16 – 04/16	**Buckeye Lake Dam Improvements, Fairfield County, OH.** *Ohio Department of Natural Resources.* Civil Engineer. Assisted with design and permitting through the various stages of construction. Participated in select meetings and assisted with review of submittals and troubleshooting. Michael Baker provided engineering services to bring Buckeye Lake Dam into compliance with current regulations. Michael Baker's services included a site assessment, permitting, final design, and construction administration.
03/16 – 05/16	**Blue Rock State Park Dam Rehabilitation, Muskingum County, OH.** *Confidential Client.* Project Manager. As project manager and engineer of record, responsible for acceptance of all parts of the design and management of the project from final design to construction management. Management responsibilities included budget, schedule, coordination, task management, permitting, final design, presentations to the client and other agencies, and construction management. Michael Baker provided engineering services for the rehabilitation of Cutler Dam in Blue Rock State Park to ensure compliance with Ohio Department of Natural Resources Dam Safety Regulations regarding inadequate spillway capacity and overtopping protection. Michael Baker's services included site investigation, hydrologic and hydraulic analysis, permitting, dam inspection, rehabilitation design, and construction management and inspection services.
07/18 – 10/20	**Stewart Lake Dam Modifications, Chillicothe, OH.** *Ohio Department of Natural Resources.* Project Manager. Responsible for management of the project for the alternative evaluation and preliminary design. Management responsibilities included budget, schedule, coordination, task management, initial permitting, design, presentations to the client and other agencies, and field supervision. The Stewart Lake Dam Improvements project involved multiple disciplines and field work. Services included survey, underwater investigations, subsurface investigations, H&H evaluation, geotechnical evaluation, and structural evaluation to determine the appropriate rehabilitation option for the project. Michael Baker provided engineering services to evaluate Stewart Lake Dam and to provide options to remedy deficiencies identified during past dam inspections, which included the breaching of Stewart Lake Dam. The results of the evaluations and remedial options were summarized in an Alternative Evaluation Report that was submitted to the client for review. Additional services include hydrologic and hydraulic analyses and permitting assistance.

Firm employed by **Michael Baker**			
Name	**Ed Kaminski, PE**	Years of relevant experience with this employer	**➲ 17**
Title	Civil Engineer	Years of relevant experience with other employer(s)	**➲ 0**
Degree(s) / Years / Specialization		B.S., / 2007 / Civil Engineering, Pennsylvania State University	
Active registration number / state / expiration date		PE077506 / Professional Engineer, Pennsylvania, / 09/30/2023 Rosgen Level I, Applied Fluvial Geomorphology, 2017	
Year registered	2010	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Dam Analysis and Design Support**	

Mr. Kaminski is a professionally licensed civil engineer with 15 years of experience in dam design and rehabilitation, stream restoration, environmental permitting, hydrologic and hydraulic design, and construction with water resource-related civil engineering projects. He performed integral roles on water resource projects relating to dam rehabilitation, dam removal, natural channel design, dam breach analysis, stream restoration, stream bank stabilization stormwater management, site development, and highway infrastructure projects. For these projects, he has prepared feasibility studies, geomorphological surveys, watershed assessments, environmental permits, hydrologic and hydraulic reports, flood studies, emergency action plans, and stormwater analyses. He is well versed in the latest hydraulic and hydrologic modeling software including HEC-HMS, HEC-RAS, ArcGIS, Hydraflow Hydrographs; and has developed multiple project specific excel routines programs that utilize historical gage data for flood studies and water supply projects. He has served as the project manager and/or senior hydrology and hydraulics lead on these projects and was responsible for the technical design aspects regarding water resources and civil engineering.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
03/09 – 09/19	**Rehabilitation of Donegal Lake Dam; Donegal Township, PA.** *Pennsylvania Department of General Services*. Project Manager. Developed hydrologic/hydraulic model of the existing dam at Donegal Lake. Prepared design for rehabilitation of the existing outlet structure, spillway reconstruction, and roller compacted concrete overtopping protection. Michael Baker provided engineering services for rehabilitation of the Donegal Lake Dam to ensure compliance with Pennsylvania Department of Environmental Protection regulations for spillway capacity and overtopping protection during the design event. Donegal Lake Dam, located in Westmoreland County, Pennsylvania, is owned by the Pennsylvania Fish and Boat Commission. The dam was constructed in 1967 and creates Donegal Lake, which is a heavily used recreational facility. Michael Baker's tasks included reviewing existing drawings and reports; performing a field assessment, hydrologic and hydraulic analysis, topographical survey, and subsurface investigation to evaluate the current condition of the dam; identifying and screening alternatives and developing remediation designs and cost estimates; permitting; and providing construction oversight. Michael Baker is also providing construction administration services, including using eBuilder.
02/09 – 10/19	**Rehabilitation of Kyle Lake Dam; Washington Township, PA.** *Pennsylvania Department of General Services*. Project Manager. Developed hydrologic/hydraulic model of the existing dam at Kyle Lake. Prepared design for articulated concrete block overtopping protection and rehabilitation of the existing spillways and outlet structure. Michael Baker provided engineering services for the Kyle Lake Dam, owned by the Pennsylvania Fish and Boat Commission, to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Kyle Lake Dam, located in Jefferson County, Pennsylvania, was constructed in 1910 and creates Kyle Lake, a heavily used recreational facility. Michael Baker's tasks included reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic analysis; performing a topographical survey, geotechnical investigation, and structural analysis to evaluate current conditions; identifying and analyzing rehabilitation alternatives; permitting; and construction administration services using eBuilder.
03/15 – 12/25 (Estimated)	**Somerset Lake Dam Renovations; Somerset Township, PA.** *Pennsylvania Department of General Services*. Project Manager. Developed hydrologic/hydraulic model of the existing dam at Somerset Lake. Prepared design for labyrinth spillway and rehabilitation of the existing outlet structure. Michael Baker is providing engineering services for the Somerset Lake Dam, owned by the Pennsylvania Fish and Boat Commission, to ensure compliance with Pennsylvania Department of Environmental Protection regulations. Somerset Lake Dam was constructed in 1956 and creates Somerset Lake, which is a heavily used recreational facility. Michael Baker's tasks include reviewing drawings and reports; field-inspecting all elements, including spillways and gatehouse structures; performing a hydrologic and hydraulic analysis; performing a topographical survey, geotechnical investigation, and structural analysis to evaluate current conditions; identifying and analyzing rehabilitation alternatives; permitting; and construction administration services using eBuilder.
03/09 – 05/13	**Dutch Fork Lake Dam Condition Assessment and Rehabilitation Design; Donegal Township, Washington County, PA.** *Pennsylvania Department of General Services Hydraulic Engineer*. Developed hydrologic/hydraulic model of the existing dam at Dutch Fork Lake. Prepared design for rehabilitation of the existing outlet structure, spillway reconstruction, and roller compacted concrete overtopping protection. Michael Baker provided engineering services for rehabilitation of the Dutch Fork

	Lake Dam, owned by the Pennsylvania Fish and Boat Commission (PFBC), to ensure compliance with Pennsylvania Department of Environmental Protection regulations regarding spillway capacity and overtopping protection, as the dam could not convey the design event. The Dutch Fork Lake Dam was constructed in 1959 and creates Dutch Fork Lake, which was a heavily used recreational facility until PFBC breached the dam in 2005 after damage to the spillway occurred during Hurricane Ivan. Michael Baker's tasks included reviewing drawings and reports; fieldinspecting all elements, including spillways and gatehouse structures; performing hydrologic and hydraulic analyses; performing topographical surveys and geotechnical investigations to evaluate current conditions; identifying and analyzing rehabilitation alternatives; developing designs; and construction management.
01/17 – 12/18	**Dam Breach Modeling-Fords Pond & Stevens Lake, Lackawanna and Wyoming County, PA.** *Pennsylvania Fish and Boat Commission*. Project Manager. Michael Baker performed a dam breach analysis for Fords Pond and Stevens Lake dams for the Pennsylvania Fish and Boat Commission. This project included; performing a review of current PADEP HEC-1 model and findings; preparing hydrologic analysis of the existing watershed to the dams as well as the contributing tributary watersheds within the flood inundation limits; and preparing a hydraulic model of Fords Pond and Stevens Lake dams, adjacent roadways, roadway crossing structures, and receiving floodplains for the purposes of analyzing the effects of the dam breaches with respect to design storm event and flooding at the downstream residences.
11/16 – 03/17	**Trostle Pond Dam Analysis, Lackawanna County, PA.** *DCNR.* Project Manager. Responsible for managing preparation of dam break analysis as well as preparation and QAQC of project deliverables. Michael Baker performed a hydrologic and hydraulic dam break analysis using state-of-the-art modeling programs and geographic information system technology to produce an accurate and reliable model of Trostle Pond Dam. Michael Baker prepared inundation mapping using a site survey and Pennsylvania Spatial Data Access LiDAR to create a three-dimensional model of the flooding limits, aiding in public safety and future dam rehabilitation efforts. Michael Baker coordinated with regulatory agencies to fast-track the model review and approval.
10/15 – 12/15	**Harris Pond Dam Analysis, PA.** *Pennsylvania Fish and Boat Commission.* Project Manager. Prepared hydrologic and hydraulic dam break analysis. Michael Baker performed a dam break analysis at Harris Pond for the Pennsylvania Fish and Boat Commission. This project included; performing a review of current PADEP HEC-1 model and findings; preparing hydrologic analysis of the existing watershed to the dam as well as the contributing tributary watersheds within the flood inundation limits; and preparing a hydraulic model of a Harris Pond Dam, adjacent roadway, roadway culvert structure, and receiving floodway for the purposes of analyzing the effects of the dam breach with respect to design storm event and flooding at the downstream residences.
12/14 – 08/15	**Lake Loramie Dam Rehabilitation, Shelby County, OH.** *Ohio Department of Natural Resources.* Civil Engineer. Responsibilities included preparing hydrologic and hydraulic design of the proposed dam modifications. These modifications include utilizing an labyrinth weir and roller compacted concrete overtopping protection. Michael Baker provided engineering services for the rehabilitation of Lake Loramie Dam as an interim risk reduction (IRR) project. The existing spillway has exhibited severe structural deterioration and was replaced with a labyrinth spillway adjacent to the existing spillway. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, rehabilitation design, and construction management and inspection services. The improvements to the dam included select partial dam removal, embankment construction (including drainage filters), construction of labyrinth spillway, stilling basin, bank floodwall, control tower, placement of a pedestrian bridge over the spillway, and site upgrades to the immediate dam area. Normal pool was maintained throughout construction to limit the impact to the park, homeowners, and businesses surrounding the lake. The rehabilitations were completed as part of an IRR project due to the unsatisfactory structural condition of the existing spillway.
04/18 – 07/18	**Chapman Dam Rehabilitation Contract 2012-2020, Pleasant Township, PA.** *Pennsylvania Fish and Boat Commission.* Hydraulic Engineer. Prepared design and environmental permitting for dam rehabilitation including lakebed dredging, shoreline stabilization, fish habitat improvement, sediment sampling, spillway reconstruction, and roller compacted concrete overtopping protection. Michael Baker performed analyses, provided permitting services, developed designs, and performed construction administration for the rehabilitation of the Chapman Dam, located on the West Branch of Tionesta Creek, within Chapman State Park. Michael Baker was responsible for designing the renovations of the existing spillway and outlet works, addressing stability and seepage concerns with the embankment, and evaluating the dam's compliance with PADEP regulations regarding overtopping protection during the design event.

Firm employed by **Michael Baker**			
Name	**Christopher "Chris" Gesing, PE**	Years of relevant experience with this employer	**➲ 41**
Title	NEPA/Permits Coordinator	Years of relevant experience with other employer(s)	**➲ 0**
Degree(s) / Years / Specialization		M.S. / 1984 / Civil Engineering, Youngstown State University B.E. / 1980 / Civil Engineering, Youngstown State University	
Active registration number / state / expiration date		0026996 / Louisiana / 03/31/2023 48960 / Ohio / 12/31/2021	
Year registered	1996 (LA) | 1984 (Ohio)	Discipline	Civil / Environmental
Contract role(s) / brief description of responsibilities		**Environmental Services (Lead)**	

As a registered professional engineer and skilled NEPA practitioner, Mr. Gesing adeptly understands the nuances of both disciplines. His 40-plus years' experience includes transportation planning; highway, bridge design; environmental compliance; mitigation and stakeholder outreach. Mr. Gesing manages complex NEPA studies for urban and rural transportation infrastructure mega-projects with construction costs routinely exceeding $1 billion. He has been continuously servicing the DOTD and Louisiana MPOs for the past 25 years. He has been the Project Manager and Environmental Lead on five of DOTD's most challenging Stage 1 (NEPA) studies including the LA 1 Improvements (Golden Meadow to Port Fourchon) EIS/ROD, which received the 2004 AASHTO President's Transportation Award for Environment and was nationally recognized as a model for environmental stewardship and streamlining. He authored DOTD's initial Stage 1 (Planning/Environmental) Manual of Standard Practice and is a LTRC and ASCE-approved NEPA instructor. Mr. Gesing is a former member of the Transportation Research Board (TRB) Committee on Environmental Analysis in Transportation (NEPA Committee) and served as the Steering Subcommittee Chair. Mr. Gesing will provide value add expertise should any environmental impacts to the project arise.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
09/99 – 09/04	**700-29-0112: LA 1 Improvements Alternatives Analysis and Environmental Impact Statement, EIS/ROD, Lafourche Parish, Louisiana.** *DOTD.* Project Manager and Environmental Lead for a $1.3 billion, 17-mile four-lane fully controlled access elevated highway on new location with bridges spanning navigable waterways. Michael Baker conducted the route location, conceptual engineering, and environmental evaluation. The project area encompassed some of the most ecologically unique and sensitive areas in Louisiana, and perhaps the Nation, and traversing the area with a highway on new location presented major environmental challenges. The project received national attention for its environmental stewardship and streamlining accomplishments and was the recipient of the 2004 AASHTO President's Transportation Award for Environment.
07/11 – Ongoing	**H.005168: New Orleans Rail Gateway EIS, Jefferson and Orleans Parishes, Louisiana.** *DOTD.* Project Manager and Environmental Lead for $638 million in improvements to the New Orleans Rail Gateway, the fourth-largest freight rail gateway in the United States. Michael Baker's services include environmental and engineering services, geographic information system (GIS) development, mapping, rail and roadway travel demand modeling, alternatives analyses, rail and roadway conceptual design, cost estimates, document preparation, stakeholder and agency coordination including FRA, DOTD, New Orleans Regional Planning Commission, seven Class 1 railroads, Amtrak, NOPB, City of New Orleans, Jefferson Parish, the Port of New Orleans and federal/state resource agencies, and extensive public and minority community outreach.
04/01 – 11/14	**700-94-0003; F.A.P. No. HPI-690-1(001): I-69 Section of Independent Utility (SIU) No. 15 EIS/ROD, Louisiana (HPC 18 U.S. 171 to I-20), Bossier, Caddo and DeSoto Parishes, Louisiana.** *DOTD*. Project Manager and Environmental Lead for a Stage 1 study of a $1.7 billion, 35-mile interstate facility on new location between U.S. Highway 171 (U.S. 171) near Stonewall in DeSoto Parish, and I-20 near Haughton in Bossier Parish. Michael Baker conducted a preliminary engineering and environmental study for I-69 Section of Independent Utility (SIU) 15 including conceptual Red River Bridge design and navigable waterway studies, interchange justification studies (IJS), Phase I Cultural Resources Assessment including probability modeling for archaeological resources and geoarchaeological study, wetland delineation and surface waters evaluations, Phase I Environmental Site Assessment (ESA), highway traffic noise studies, Endangered Species Act Section 7 consultation and Interior least tern (ILT) and Red-cockaded woodpecker (RCW) biological assessments.
05/08 – 05/11	**700-08-0130: East-West Corridor EA/FONSI, Bossier Parish, Louisiana.** *Northwest Louisiana Council of Governments (NLCOG).* Project Manager and Environmental Lead for a new location eight-mile, two-lane urban collector with right-of-way clearance for future widening to a five-lane facility when traffic conditions warrant. The purpose of the new $56 million facility was to alleviate congestion and reduce travel delays along the other roadways that link the rapidly growing residential areas of Bossier Parish with the Shreveport and Bossier City employment centers.Michael Baker's services included traffic analyses including conducting traffic counts and forecasting traffic using NLCOG's TransCAD regional travel demand model (TDM); Phase I Cultural Resources Assessment including probability modeling for

	archaeological resources and geoarchaeological study; wetland delineation and surface waters evaluations; Phase I Environmental Site Assessment (ESA); and highway traffic noise studies.
08/02 – 12/06	**736-99-1025: Stage 1 – Planning/Environmental Manual of Standard Practice, Statewide, Louisiana.** *DOTD.* Project Manager, Author and Course Instructor. Developed the Manual of Standard Practice and training program and conducted several half-day training sessions. The Stage 1 (Planning/Environmental) Manual of Standard Practice provides transportation project managers guidance in advancing transportation improvements projects through Stage 1 of the DOTD's Project Development Process (PDP). A half-day training course was developed, and Michael Baker provided several half-day training sessions to DOTD and FHWA Louisiana Division staff.
08/97 – 09/05	**700-09-0117: North-South Expressway, Location and Environmental Study, EIS/ROD, Caddo Parish, Louisiana.** *DOTD*. Project Manager for a $670 million, 35-mile four-lane fully controlled highway on new location between I-220 in Shreveport, Louisiana, and the Arkansas state line (now referred to I-49 North). The project included logical termini evaluation, interchange justification studies (IJS), Phase I Cultural Resources Assessment, wetland delineation and surface waters evaluations, Phase I Environmental Site Assessment (ESA), highway traffic noise studies, and air quality impact assessment.

Firm employed by **Michael Baker**			
Name	**Thomas Jackson "TJ" Holliday, PWS**	Years of relevant experience with this employer	➲ **12**
Title	Wetlands/Species Coordinator	Years of relevant experience with other employer(s)	➲ **11**
Degree(s) / Years / Specialization		B.S. / 1998 / Biology, Delta State University	
Active registration number / state / expiration date		2447 Professional Wetland Scientist / Nationwide / 04/07/2024	
Year registered	2014	Discipline	Environmental
Contract role(s) / brief description of responsibilities		**Environmental Services (Support)**	

Mr. Holliday is an environmental specialist with project experience involving various levels of EA and other issues related to NEPA. His responsibilities have included studies for wetlands, floodplains, water quality, coastal resources, threatened and endangered species, cultural resources, hazardous materials, noise and air quality, and community impacts. He is a Certified Professional Wetland Scientist with over 20 years of field experience conducting wetland and stream assessments and habitat evaluations. Mr. Holliday's primary project duties have included data collection and analyses, document preparation, agency coordination, public outreach, and regulatory permitting and compliance. Mr. Holiday will provide value added expertise should any protected species be identified as conflicting with the project limits.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
07/11 – Ongoing	**New Orleans Rail Gateway, Jefferson and Orleans Parishes, LA.** *DOTD.* Environmental Specialist. Conducted field studies and documented findings for wetlands and other waters of the U.S. and hazardous materials. Michael Baker is providing environmental and engineering services to develop an Environmental Impact Statement (EIS) for the New Orleans Rail Gateway, the fourth-largest freight and passenger rail gateway in the United States. Michael Baker's services include project management, review of previous studies, environmental resources investigations, geographic information system development, mapping, rail and roadway travel demand modeling, alternatives analyses, rail and roadway conceptual design, cost estimates, document preparation, stakeholder and agency coordination, and extensive public outreach.
10/04 – 10/14	**SH 146 Environmental Assessment from Fairmont Parkway to SH 3, Harris County, TX.** *Texas Department of Transportation.* Environmental Specialist. Assisted with preparation of the EA document, attended client meetings, and was responsible for the Section 404 permit. Michael Baker, as prime contractor, was the primary author and editor for the preparation of an EA. The EA evaluated the proposed improvement and expansion of approximately 23 miles of SH 146 (from Fairmont Parkway to SH 3) to reduce traffic congestion, improve hurricane evacuation, and improve mobility and safety. Michael Baker developed the Purpose and Need statements, Alternatives Analyses, Hazardous Materials Initial Site Assessment, Air and Noise Modeling, Community Impact Assessment, Natural Resource Studies, Section 404/10 permit, and Section 9 (USCG) permits.
04/13 – 04/16	**Rio Hondo Lift Bridge Environmental Services, Cameron County, TX.** *Texas Department of Transportation.* Environmental Specialist. Responsible for the completion of a Categorical Exclusion (CE) Document. Completed field studies and coordinated a USCG navigation permit, as well as a Section 404 permit. Michael Baker is provided environmental services for the rehabilitation of the FM 106 lift bridge over the Arroyo Colorado River. Michael Baker's services included completion of the environmental scoping checklist, project coordination checklists, biological and water resources field surveys, environmental documentation, and public involvement including a Public Hearing. Michael Baker assisted TxDOT with agency coordination, specifically the U.S. Coast Guard, U.S. Fish and Wildlife Service, Texas Historic Commission and the Texas Parks and Wildlife Department, regarding specific bridge rehabilitation and design elements. Built in the early 1950s, the historic bridge is one of four movable bridges in the State of Texas. It spans the Arroyo Colorado, a navigable waterway that provides a route for ships and barge traffic coming inland from the Gulf.
01/15 – 07/16	**Neches River Railroad Crossing Environmental Assessment/Geometric Schematic, Jefferson and Orange Counties, TX.** *Texas Department of Transportation.* Environmental Specialist. Responsible for environmental field studies, assisted with document preparation, and provided QA/QC of the environmental document. Michael Baker prepared a geometric design schematic and an EA for a new rail crossing of the Neches River in Beaumont, Texas. Michael Baker identified a purpose and need for the proposed project; developed four alternative alignments and four bridge options for the proposed crossing; and analyzed potential environmental issues, including extensive wetlands, historic and Section 4(f) resources, low income and minority neighborhoods, and a Superfund site, among others. The team also facilitated several stakeholder meetings; developed preliminary designs, cost estimates, and right-of-way requirements for each alignment; and recommended a "preferred alignment" and bridge type.
09/13 – 06/18	**Highway 70 Widening Design (I-30 to Hot Springs), Garland and Saline Counties, AR.** *Arkansas Department of Transportation.* Environmental Manager. Responsible for conducting environmental investigations necessary to prepare environmental documentation to satisfy National Environmental Policy Act (NEPA) requirements in support of a road widening project in Garland and Saline Counties, Arkansas. Michael Baker provided roadway and bridge design and environmental services for the widening of approximately 18.9 miles of Highway 70 from Dr. Martin Luther King Jr. Expressway interchange on the west in Hot Springs to the I-30 interchange on the east

	end. Michael Baker provided project management, developed conceptual alternatives, performed environmental impact studies, and facilitated public involvement efforts. Michael Baker also performed a geotechnical investigation and prepared a maintenance of traffic (MOT) plan and traffic management plan (TMP). Michael Baker developed preliminary and final roadway and bridge design, including traffic signal warrants analysis, right-of-way drawings, and hydraulic studies. Michael Baker also provided construction phase review services.
06/12 - Ongoing	**Natural Environment Master Contract, Statewide Mississippi.** *Mississippi Department of Transportation.* Project Manager. Michael Baker provides environmental consulting services to MDOT for bridge construction and roadway improvement projects statewide in Mississippi under a three-year master services agreement (three consecutive contracts). The scope of services under this contract is to assess impacts to wetlands, waters of the U.S., and threatened and endangered (T/E) species. Michael Baker's services include data collection and analysis, field assessments, hydrologic and hydraulic analysis, report preparation, meeting coordination, and mitigation banking.

Firm employed by **Michael Baker**			
Name	**Mary Flynn, PE**	Years of relevant experience with this employer	➲ **9**
Title	Associate Vice President	Years of relevant experience with other employer(s)	➲ **15**
Degree(s) / Years / Specialization		B.S. / 1997 / Civil Engineering & Surveying	
Active registration number / state / expiration date		PE.0036931 / Louisiana / 09/30/2022 ATSSA Traffic Control Supervisor, 12/13/2023 Traffic Control Flagger, 02/10/2024	
Year registered	2012	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Construction Inspection Services (Lead)**	

Ms. Flynn is available to serve as an on-site Project Engineer. She brings 25 years of experience providing CE&I/OV services, including the last 8 years as PM and Project Engineer on DOTD CE&I IDIQ contracts, to ensure quality construction and compliance with plans and specifications. Ms. Flynn will:

- **Work with QA/QC Manager, Steve Kramer, PE, to ensure each Task Order achieves contractor compliance with plans and specifications, quality, budget, and schedule**
- **Ensure contract requirements are met with efficient and cost-effective experts who are certificated to successfully deliver the Task Order**
- **Maintain communication with the DOTD Coordinator to ensure the needs are met on each Task Order**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
03/13 – 06/18	**Retainer Contract for Design-Build Support Services, Statewide, Louisiana.** DOTD. **Task Order 1: Statewide Construction Quality Assurance Plan (CQAP), Statewide, Louisiana**. DOTD. Task order was to develop a CQAP for statewide use on Design-Build Projects. Ms. Flynn was responsible for drafting the Plan, meeting with FHWA, DOTD and other stakeholders to review and obtain comments, meet with TxDOT staff to discuss their QAP recommendations, and modify document until accepted by FHWA. **Task Order 2: CQAP Sharepoint Database**, DOTD. Task consists providing Design-Build CQAP Database Development relative to the US 90 (Albertson – Ambassador Caffery) Design Build Project that automatically ran statistical analysis' on specified materials. Ms. Flynn's responsibility was to develop the worksheets necessary to input project material sampling and testing results for the database developers, identify the parameters for statistical analysis, perform beta testing on each material sheet in SharePoint to verify functionality, train FHWA, DOTD, and project staff on utilization of database. **H.010620.6 Task Order 3: US 90 (I-49 South), Albertson's Parkway to Ambassador Caffery, Design-Build Owner Verification, Lafayette Parish, LA.** DOTD: Owner Verification Manager / Project Engineer. Responsible for contract administration/project management, construction engineering, and managing quality inspection and materials sampling and testing for all phases of construction verification of activities and testing per CQMP, including new structure construction (AASHTO girder and steel plate girder), existing structure replacement/widening, fabrication of precast girders and MSE wall panels, MSE wall installation utilizing both straps and geogrid, full depth asphalt roadway, embankment and base course. She was also responsible for statistically validating test data according to the CQAP and tracking of Michael Baker inspection and testing within the DOTD's SharePoint Database for design-build projects, reviewing and responding to RFIs and NCRs, reviewing plans and shop drawings, verifying test data for material acceptance, and project coordination meetings. She served as liaison between the local business owners, local project stakeholders, and DOTD Project Manager.
01/12 – 01/13	**H.003046: I-10 Widening, Siegen to Highland, Design-Build OV, Baton Rouge, LA.** DOTD. As Assistant Project Engineer/Assistant Project Manager. Ms. Flynn was responsible for contract administration, construction engineering, review of shop drawings and as-built plans, and supervision of inspection and materials sampling and testing for all phases of construction, including structural concrete, PCC paving, embankment and base course, and fabrication inspection of girder and pile. Ms. Flynn verified inspector daily entries in SiteManager were accurate, thorough, and up to date. Project included PCC Paving, widening of the I-10 Bridge of Wards Creek Diversion Canal, and replacement of the I-10 Bridge over the KC Southern Railroad and LaCrete Lane utilizing a combination of AASHTO precast girders and steel plate girders.
06/08 – 12/09	**052-02-0024: John James Audubon Bridge Design-Build Owner Verification, Ventress, LA.** DOTD. Assistant Quality Control Manage., Ms. Flynn was responsible for the quality management and QC inspection of all construction activities for the 52-span bridge (AASHTO Type III and BT-72), and all construction activities for the west approach of the cable stayed bridge (15 spans including AASHTO type III, BT-72 and steel plate girders) including Rotational Capacity of the bolted connections. She assessed the effectiveness of the construction quality plan; performed constructability review of plans prior to construction, reviewed shop drawings, verified processing, delivery, installation, and use of products and services; evaluated quality of work for effective testing and inspections from substructure to deck completion.

03/19 – Ongoing	**IDIQ Contract for CE&I with Majority of Work in District 07, Statewide, LA.** DOTD. **H.010916.6 Task Order 1: Prien Lake Re-Deck & Safety Improvements, Calcasieu Parish, LA.** DOTD. As part of a Staff Augmentation Services contract, Ms. Flynn was the Project Manager for this re-decking project. Her responsibilities were to provide the DOTD with certified inspection staff and qualified office management staff to successfully complete the project. **H.012018 Task Order 2: Adaptive Traffic Signal Design and Implementation, Lafayette Parish, LA.** DOTD. As part of a full services contract, Ms. Flynn was responsible for Project Management and Project Engineering for this ITS Project. Ms. Flynn's is responsible for contract administration/project management, construction engineering, and managing inspection staff for all construction activity. Duties include project, utility and local Entity coordination, manage meetings, development of TO sampling plan, verifying inspectors maintain accurate field records and material documentation, equipping inspection staff appropriately for testing and documentation per needs of TO, verify and approve monthly estimate, developing As-Built plans, developing change orders for DOTD approval, manage the RFI process utilizing DOTD established forms, disseminating press releases as needed, and performing any other engineering function as requested by the Area Engineer (AE). **H.003184.6 Task Order 3: I-10: Texas State Line – E. of Coone Gully, Calcasieu Parish, LA**. DOTD. As part of a Staff Augmentation Services contract, Ms. Flynn was the Michael Baker Project Manager for this re-decking project. Her responsibilities were to provide the DOTD with certified inspection staff and qualified office management staff to successfully complete the project.
03/20 - Ongoing	**IDIQ Contract for Construction Engineering and Inspection Services for Safety Projects (CE&I) District 61, 62, and 02.** DOTD. As Project Manager & Project Engineer, Ms. Flynn is responsible for contract administration/project management, construction engineering, and managing inspection staff for all construction activity under full-service Task Orders (TO). Duties include project and utility coordination, manage meetings, development of TO sampling plan, verifying accuracy of field records and sampling/testing documentation, equipping inspection staff appropriately for testing, and documentation per needs of TO, verify and approve monthly estimate, developing As-Built plans, developing change orders for DOTD approval, manage the RFI and claims process utilizing DOTD established forms, disseminating press releases, and performing any other engineering function as requested by the AE. **H.013271.6 Task Order 1: Tangipahoa PH Local Road Safety Upgrade, Tangipahoa Parish, Louisiana.** The project consists of upgrading signage, refreshing pavement markings, and installation of solar powered flashing beacons, on various local roads in Tangipahoa Parish. Est completion Feb 2022. **H.013532.6: Task Order 2: Denham Springs Rd Signing & Striping, Livingston Parish, Louisiana.** The project consisted of upgrading signage, refreshing pavement markings, closure of two (2) boulevard median turn areas, and related work on various local roads. Project complete. **H.012473.6: Task Order 3: Marconi Dr Shared-Use Path, Orleans Parish, Louisiana**. The project consisted of clearing and grubbing, installing a 10 foot wide shared-use path and raised composite wood boardwalk and all associated striping and signage within New Orleans City Park from Zachary Taylor Drive to Harrison Avenue. Project complete, Hurricane Ida repairs in progress. **H.009308.6: Task Order 4: New Orleans DPW SRTS Sidewalk Project, Orleans Parish, Louisiana**. The project is part of the "Safe Routes to School" program, involving safety upgrades to five schools in the Orleans Parish area. Components of the safety upgrades include shared-use path, sidewalks, ADA crossings, traffic signalization and related work. Estimated Completion 04/2022. **H.012527.6: Task Order 5: Local Road Safety Upgrades (W. Feliciana), West Feliciana Parish, Louisiana**. The project consists predominately of replacing outdated and damaged guardrail, signage and striping on 10 routes within the parish. Estimated completion May 2022.

Firm employed by **Michael Baker**			
Name	**Jason Mashell, PE**	Years of relevant experience with this employer	➲ **2**
Title	Construction Services Department Manager	Years of relevant experience with other employer(s)	➲ **18**
Degree(s) / Years / Specialization		B.S. / 2001 / Civil Engineering, Louisiana Tech University	
Active registration number / state / expiration date		45440 / Louisiana, Professional Engineer – Civil / 09/30/2021 97431 / Texas, Professional Engineer – Civil / 03/31/2022 ATSSA Traffic Control Technician-LA State Specific / 08/03/2025 ATSSA Traffic Control Supervisor-LA State Specific / 08/05/2025 Traffic Control Flagger / 12/01/2025	
Year registered	2021 (LA) | 2006 (Texas)	Discipline	Civil
Contract role(s) / brief description of responsibilities		**Construction Inspection Services (Support)**	

Jason has close to 20 years of managing multiple types of construction projects. As a formal Texas Department of Transportation AE, Jason was responsible for managing 42 inspectors and recordkeepers across more than 40 simultaneous CE&I and construction projects valued over $600 million. His construction experience includes the management of more than 50 projects involving new bridge location replacements and widenings on interstates, urban and rural highways, and off-system roadways.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
06/06 - 03/10	**I-20 Frontage Road Project, Dallas, TX.** *Texas Department of Transportation*. Project Engineer. Served as TxDOT Project Engineer that was responsible for working with construction project manager, contractor and Engineer of Record to resolve all field construction issues, resolving RFIs and processing and negotiating all change orders. This $15M project constructed new location concrete pavement eastbound and westbound frontage roads with asphalt base, lime treated subgrade, new drainage structures, concrete and steel girder bridges, retaining walls and illumination. This project was adjacent to large truck stops, which caused a large number of large trucks to pass through the construction work zone. Due to this large volume of trucks, traffic control modifications were made throughout the construction to increase turning radii and lane widths to allow trucks to safely travel through the work zone.
03/12 – 11/15	**Sylvan Ave. Bridge Replacement, Dallas, TX.** *Texas Department of Transportation*. Construction Engineer. While at TxDOT, served as Construction Engineer that was responsible for overseeing inspectors in order to ensure project was built in accordance to plans and specifications, reviewing monthly construction schedules, resolving all contractor questions and RFIs, performing and negotiating all project change orders and coordination with the City of Dallas and Flood Control regarding construction activities. This $42 M project replaced an existing bridge structure that was located in the flood plain of the Trinity River that would flood whenever the Trinity River would become closing to over topping its banks. The new bridge structure was constructed at a higher elevation out of the flood plain and utilized a new concept of the time, spliced concrete girders. This engineering design consisted of utilizing concrete girders that were tied together by post tensioning. This new concept was chosen as cheaper alternative to steel girders and required less bents to be constructed in the floodplain. Work on this project required coordination with the Army Corp of Engineers and the City of Dallas Flood Control due to being within the earthen levees of the Trinity River flood plain.
06/16 – 08/19	**US 175 (SM Wright) Reconstruction Project, Dallas, TX.** *Texas Department of Transportation*. Construction AE. Served as the TxDOT Construction Engineer and AE overseeing project budget and schedule, assigning inspectors and engineers to oversee project, resolving any contractor issues, providing City of Dallas officials with project updates, and coordinating/presenting quarterly meetings with community stakeholders. This $103M project reconstructed the US 175 and I-45 Interchange and involved construction of new prestressed concrete beam and steel girder spanned bridges, retaining walls, noise walls, drainage, concrete and asphalt paving, traffic items, railroad coordination and also required mitigation of hazardous soils and groundwater. New bridges were constructed within the floodplain footprint of the Trinity River and work was near existing floodgates that had to be left in place during the construction.
03/15 – 12/17	**Marsalis Ave. Bridge Replacement, Dallas, TX.** *Texas Department of Transportation*. Construction Engineer. While at TxDOT, served as Construction Engineer that was responsible for ensuring project inspection of bridge, retaining wall, drainage and pavement work, resolving all contractor questions and RFIs, reviewing contractor's schedule submittal for compliance and resolving any contractor delay claims. This $3M project replaced an existing bridge structure with a new prestressed concrete girder bridge that spanned Five Mile Creek. This project was in an environmentally sensitive area that required minimum construction disturbance work done in the creek and required coordination and permission from the City of Dallas Park Department if any trees needed to be removed for any construction work.

02/16 – 07/18	**I-345 Steel Girder Repair Project, Dallas, TX.** *Texas Department of Transportation*. Construction Engineer. While at TxDOT, served as Construction Engineer for this project and duties included resolving any contractor issues and RFIs, coordinating with Public Information Office regarding the series of closures that were needed on this busy highway corridor, reviewing project schedule, preparing and negotiating all project change orders and overseeing inspection staff assigned to project. This project consisted of making repairs to address the cracked webs of the steel girders and to provide additional connections and supports to the fracture critical girders along this entire roadway. Special repair details were developed by the consultant designer and the TxDOT Bridge Division that required a mockup and trial repair in order to determine its effectiveness. This project required the continued use of QA/QC bridge and welding inspectors along with the usual TxDOT inspection in order to ensure work was being done in accordance to the established procedures.
10/19 – Ongoing	**I-35E (Lowest Stemmons) Reconstruction Project, Dallas, TX.** *Texas Department of Transportation*. Manager of CE&I staff. Served as Manager of CE&I staff overseeing this project. This congestion relief project provided operational improvement along I-35E with construction of collector-distributor roads and reconstruction of frontage roads from IH 30 to North of Oak Lawn Avenue. The construction includes constructing four to six collector-distributor lanes, six new prestressed concrete beam bridges, two bridge widenings, and 17 retaining walls. Staff responsibilities included project inspection, testing of materials, reviewing contractor schedule submittals, reviewing traffic control, project SW3P, preparing change orders and working with contractor, TxDOT and EOR to resolve field issues. Jason worked with staffing to resolve field issues and provide recommendations to TxDOT to resolve any contractor delay claims. Est Completion 12/21
09/13 – 01/19	**SH 78 Roadway Widening Project, Wylie, TX.** *Texas Department of Transportation*. Construction Engineer. While at TxDOT, served as Construction Engineer that was responsible for overseeing project inspection and material testing, resolving RFIs, processing change orders and reviewing monthly schedules. This $21 M project involved the widening of a rural two-lane highway into an urban six lane highway and involved installing new concrete pavement, drainage and bridge structures, retaining walls and new traffic signals. The new bridges were installed across the East Fork of the Trinity River that flooded and came out of its bank's multiple times during the course of the project and required careful environmental coordination and traffic control modifications in order to safely construct.
03/14 - 07/19	**SH 121 Reconstruction Project, Grapevine, TX.** *Texas Department of Transportation*. Project Engineer. While at TxDOT, served as Project Engineer and later became Area Engineer over project. Responsibilities including overseeing inspection staff, testing of materials, resolving RFIs, processing change orders, reviewing project schedules, and processing of monthly estimates. This $58M project constructed new location concrete pavement frontage road and widened the concrete pavement main lanes. This project also featured, asphalt overlay, lime treated subgrade, new location and widen concrete girder bridges, drainage, retaining walls, traffic signal, sidewalks and illumination. This project began with utilities in conflict and Jason worked with the contractor to modify the traffic control sequence to work to allow construction work to progress while utilities were being relocated.
0917 – 08/19	**US 67 Widening Project. Cedar Hill, TX.** *Texas Department of Transportation*. Construction AE. Served as the TxDOT AE that was responsible for the assignment of inspectors for construction and material compliance, overseeing project and reviewing construction schedule for compliance. This $59M project widened the concrete main lanes of US 67, new location entrance and exit ramps, asphalt base, lime treated subgrade, widened and constructed new concrete spanned bridges, new drainage, retaining walls and illumination. During widening work, hazardous liquid petroleum material leached into the work zone that was later determined to be a leak from an old gas tank off of right-of-way. Jason worked with the TxDOT Environmental Division to formulate a plan capture this material into a sump area that would allow construction to continue in this area and not allow this hazardous material to contaminate the existing storm drain system.

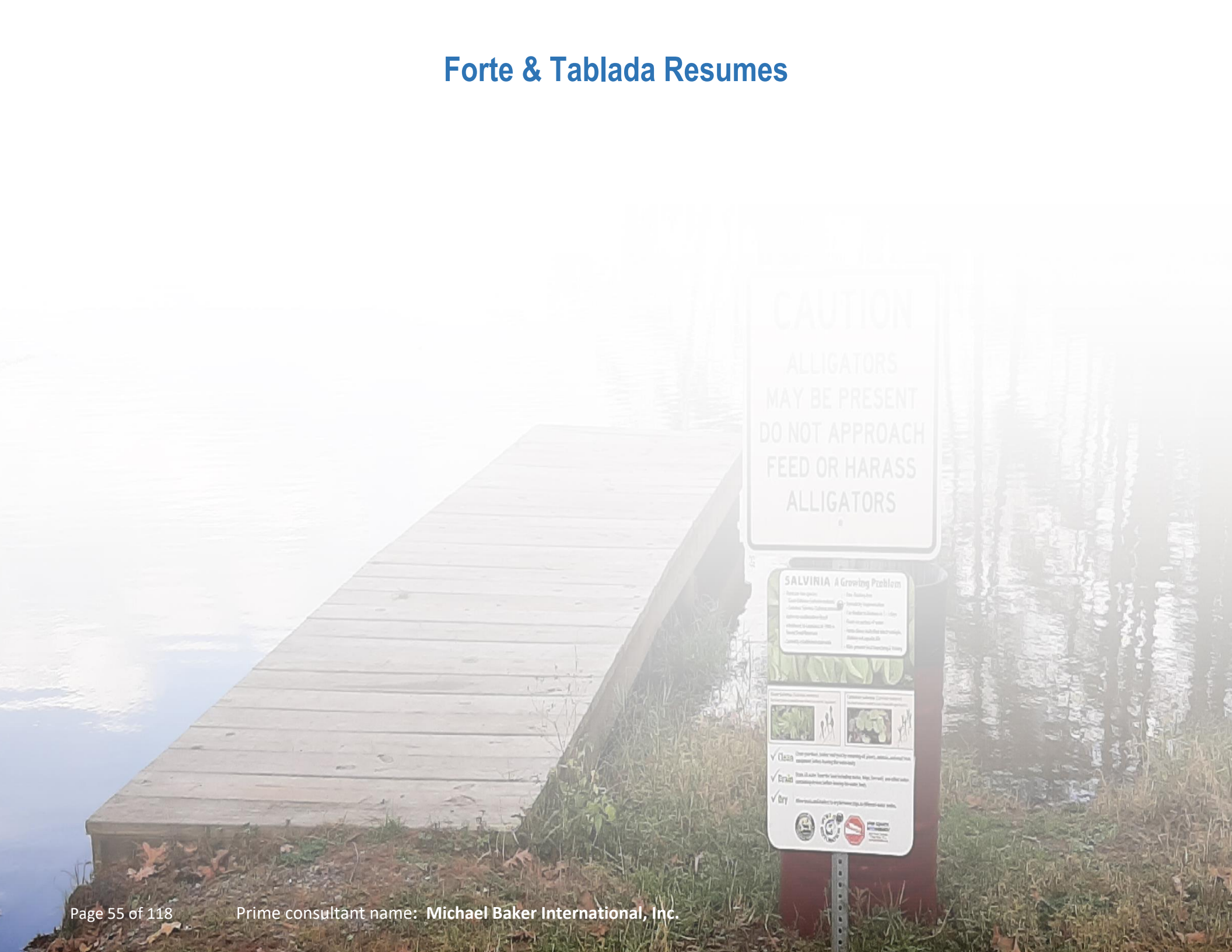
Firm employed by **Michael Baker**			
Name	**Stephen Clancy, PLS, PSM, GISP**	Years of relevant experience with this employer	**➲ 12**
Title	Surface Transportation Manager	Years of relevant experience with other employer(s)	**➲ 8**
Degree(s) / Years / Specialization		B.S. / 1998 / Survey and Mapping	
Active registration number / state / expiration date		Professional Land Surveyor 5059 / Louisiana / 03/31/2023	
Year registered	2011	Discipline	Survey
Contract role(s) / brief description of responsibilities		**MPR 5. Survey & Mapping (Support)**	

Mr. Clancy is a licensed Professional Surveyor and Mapper with extensive experience in Geographic Information Systems, LiDAR, GPS and traditional surveying and mapping. In addition to serving in various capacities in surveying and GIS related activities, Mr. Clancy also has many years of university teaching experience in the fields of Geomatics, Photogrammetry and GIS. Mr. Clancy has a diverse and broad background in the Geospatial Sciences and is charged with the technical management and operational oversight of Michael Baker's Mobile LiDAR systems and LiDAR processing, nationally. Mr. Clancy will provide surveying services if Forte and Tablada staff are unavailable.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
03/13 - 06/18	**Retainer Contract for Design-Build Support Services, Statewide, LA.** *DOTD*. Technical Manager. Responsible for management, supervision, and quality assurance of all data collection activities for the capture of Mobile LiDAR data and spot checks of contractor survey control. Coordinated LiDAR processing activities and provided guidance on deliverables. Under a five-year retainer contract, Michael Baker provided construction inspection and quality assurance for statewide design-build transportation projects. Michael Baker's services included project initiation, design-build procurement support, contract administration and management, design and construction quality acceptance OV, CE&I, partnering, public information support, document control, and dispute resolution.
09/09 - Ongoing	**I-69, Section of Independent Utility No. 15, U.S. 171 to I-20. Bossier, Caddo, and DeSoto Parishes, LA.** *DOTD*. Technical Manager. Responsible for planning, management, supervision, and quality assurance of all data collection activities for the capture of Mobile LiDAR data and imagery including control layout planning and development. Performed LiDAR processing and imagery calibration for downstream feature extraction and product development. Coordinate preparation of final Mobile LiDAR products and performed final QC of deliverables. Michael Baker conducted a preliminary engineering and environmental study for I-69, Section of Independent Utility 15. Michael Baker's services included project management, environmental investigations, preliminary roadway engineering, geographic information system environmental mapping and analysis, global positioning system survey and digital orthophotography; conceptual bridge design, traffic demand modeling and traffic forecasting, preparation of a corridor preservation memorandum of agreement, preparation of draft and final EIS and record of decision, and stakeholder outreach.
08/09 - 09/09	**I-69 Survey Services, LA.** *DOTD*. Surveyor. Calculated centerline points and created stake-out sheets with coordinate lists. Performed GPS stake-out of multiple proposed centerline realignments for I-69.
04/13 - 06/13	**Static Scanning and Processing of Nesser Overpass, Baton Rouge, LA.** DOTD. Project Manager. Managed the static scanning of the Nessar Overpass bridge for deformation monitoring purposes. Reviewed the data collected and presented to the client.
09/13 - 01/14	**Dallas North Tollway (DNT)/President George Bush Turnpike (PGBT) Interchange Improvements and DNT Widening Project, Plano, TX.** *North Texas Tollway Authority*. Technical Manager. Responsible for management, supervision, and quality assurance of all data collection activities for the capture of Mobile LiDAR data. Coordinated LiDAR processing activities and provided guidance on deliverables. Michael Baker was responsible for advancing the conceptual design through schematic development, preliminary engineering, and final design for operational improvements to the Dallas North Tollway (DNT)/President George Bush Turnpike (PGBT) Interchange and mainlane widening to the DNT. The DNT/PGBT Interchange forms the crossroads of these two principal corridors. Michael Baker provided route and design studies, field surveying, geotechnical engineering, environmental studies, public involvement, right-of-way mapping, traffic control, sequence of construction, removal plans, roadway design, retaining wall design, drainage design, SUE, utility coordination, bridge design, traffic signal coordination, ITS, permitting, toll gantry design, and landscape and irrigation design.
03/10 - 04/10	**S.R. 25 Mobile LiDAR Vertical Accuracy Validation. Jackson, MS.** *Mississippi Department of Transportation*. Survey Manager. Responsible for management, supervision, and quality assurance of all data collection activities during the course of the Mobile LiDAR contract. Michael Baker provided mobile LiDAR vertical accuracy validation services along an eight-mile corridor with 16 miles of divided roadway of State Route 25, and the first 500 feet of all intersecting public roads, to perform vertical accuracy assessments and planimetric roadway feature extractions to support future traffic data collection, feasibility studies, geographic information systems (GIS), and highway performance monitoring system reporting.
01/17 - Ongoing	**Mayes Street Bridge Replacement, Jackson, MS.** *City of Jackson*. Technical Manager. Supervised static scanning activities surrounding the Mayes Street Bridge and West Street intersection. Performed registration of individual point clouds and then adjusted to ground control. Prepared various intermediate datasets for extraction and

	review. Michael Baker is developing final roadway and bridge construction plans to replace an existing bridge on Mayes Street that spans the ICRR railroad in Jackson, Mississippi. This project will replace the existing 160-foot-long bridge with a 224-foot-long prestressed concrete bridge.

Forte & Tablada Resumes



Prime consultant name: **Michael Baker International, Inc.**

Firm employed by **Forte & Tablada**			
Name	**Bradley "Brad" Holleman, PSL, EI**	Years of relevant experience with this employer	➲ **1**
Title	Senior Vice President, Survey / Advanced Measurements & Modeling	Years of relevant experience with other employer(s)	➲ **14**
Degree(s) / Years / Specialization		B.S.C.E. / 2009 / Civil Engineering	
Active registration number / state / expiration date		Professional Land Surveyor 5082 / LA / 9/30/2022	
Year registered	2012	Discipline	Surveying
Contract role(s) / brief description of responsibilities		**MPR 5. Survey & Mapping (Lead)**	

Brad has surveyed a wide range of drainage related projects in his career from collecting field data for culvert crossings to developing an existing drainage map of the Tchefuncte River basin crossing I-12. His existing drainage map experience includes a systematic process of compiling readily available LiDAR data, drone mounted LiDAR data collection, and field surveyed data features to produce an existing drainage and catchment area analysis for use in design and modeling. Brad's experience also includes bridge LiDAR scanning/modeling for bridge replacement or rehabilitation, off-system bridge surveys, bridge monitoring surveys and right of way mapping. In particular, Brad specializes in the use of mobile mapping with terrestrial mobile LiDAR and aerial mobile LiDAR with unmanned aerial vehicles (drones) for drainage related projects. He has also used a manned helicopter mounted with a LiDAR sensor to collect ground elevation data in large, wooded areas for a feasibility study and drainage analysis on a proposed development.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
02/15 - 06/15	**Slidell Manor Drainage Improvements, St. Tammany Parish, LA.** *St Tammany Parish Government.* Served as project surveyor for the topographic survey and existing drainage map development for drainage improvement in the Slidell Manor subdivision in St. Tammany Parish.
05/15 - 08/15	**Jacobs Drive Drainage Survey, St. Tammany Parish, LA.** *St Tammany Parish Government.* Served as project surveyor for the topographic survey and existing drainage map development for drainage improvements along Jacobs Drive in St. Tammany Parish.
03/14 - 07/14	**Huntington Estates Drainage Study Survey, St. Tammany Parish, LA.** *St Tammany Parish Government.* Served as project surveyor for the topographic survey and existing drainage map development for drainage improvements in the Huntington Estates subdivision in St. Tammany Parish.
08/14 - 12/14	**Marrio Road Drainage Study, Ascension Parish, LA.** *Ascension Parish Government.* Served as project surveyor for the topographic survey and existing drainage map development for drainage improvements on Marrio Road in Ascension Parish.
02/09 - 03/10	**Aspen Heights Drainage Study Survey, Baton Rouge Parish, LA.** *East Baton Rouge Parish Government.* Served as project manager for the topographic survey for the drainage study at an apartment complex in East Baton Rouge Parish.
05/12 – 09/12	**H002446 Tchefuncte River Bridge, St. Tammany Parish, LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for a bridge replacement project in St. Tammany Parish.
01/07 - 04/07	**Laurel Ridge Levee, Ascension Parish, LA.** *Ascension Parish Government.* Served as field data collector for topographic survey of the Laurel Ridge levee system in Ascension Parish.
06/15 - 12/15	**H011720 US 90 Drainage Canal Erosion Repair, LA.** *DOTD.* Served as project surveyor for the LiDAR scanning and volumetric calculations of the cavern created due to seepage under the US 90 bridge under Drainage Canal.
08/19 - 12/19	**Stone Road Extension to Powell Drive, St. Tammany Parish, LA.** *St. Tammany Parish Government.* Served as project surveyor for the topographic and existing drainage of a proposed roadway in St Tammany Parish.
07/19 - 09/19	**Methanex Road Extension and Ring Road, LA.** *Ford Bacon Davis.* Served as project surveyor for the development of an existing drainage map for the design of a new road to service an industrial area.
02/18 - 07/18	**PR 929 @ Braud Road Roundabout, Ascension Parish LA.** *Ascension Parish Government.* Served as project surveyor for the topographic survey and existing drainage map development for a roundabout at PR 929 at Braud Road in Ascension Parish.
02/17 - 01/18	**Roddy Road Widening, Ascension Parish, LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for the widening of a parish road in Ascension Parish.
04/20 - 11/20	**H000688 US 11 Norfolk Southern Railroad Overpass, St. Tammany Parish LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for a railroad overpass replacement in St. Tammany Parish.

04/19 - 08/19	**H005121 LA 1 / LA 415 Connector, Baton Rouge Parish, LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for a proposed roadway connecting LA 1 with LA 415 in West Baton Rouge Parish.
12/14 - 03/16	**H011137 I-12: LA 21 to LA 59, St. Tammany Parish, LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for interstate 12 widening and improvements in St. Tammany Parish.
03/17 - 03/18	**H004987 US 190 Collin Boulevard Widening, LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for the widening of a 4 mile stretch of Collins Boulevard in St Tammany Parish.
09/15 - 11/15	**H005403 Hooper Road Extension, St. Tammany Parish, LA.** *DOTD.* Served as project surveyor for the topographic survey and existing drainage map development for the roadway extension over the Amite River connecting East Baton Rouge Parish is Livingston Parish.
03/15 - 06/15	**Strain Road Bridge over Drainage Bayou, Baton Rouge Parish LA.** *East Baton Rouge Parish Government.* Served as project surveyor for the topographic survey and existing drainage map development for an off-system bridge in East Baton Rouge Parish.
09/21 - 09/21	**Westbank Closure Complex Multi-Beam Hydrographic Survey, Belle Chase, LA.** *South Louisiana Flood Protection Authority – West.* Served as project surveyor for the comprehensive multibeam hydrographic scour survey.

Firm employed by **Forte & Tablada**			
Name	**Jace Ricard, PLS**	Years of relevant experience with this employer	➲ **2**
Title	Surveyor	Years of relevant experience with other employer(s)	➲ **3**
Degree(s) / Years / Specialization		B.S./2014/Geomatics	
Active registration number / state / expiration date		PLS 5205 / LA / 09/30/2023	
Year registered	2019	Discipline	Survey
Contract role(s) / brief description of responsibilities		**Survey & Mapping Support**	

Jace is a Professional Land Surveyor in the State of Louisiana with 5 years of land surveying experience. He has experience with Civil 3d, Microstation, CAD Conform, and Inroads. He has experience with Property Surveys, Topographic Surveys, and, Right-of-Way Maps. Certified ATSSA Registered Flagger, Traffic Control Technician, and Traffic Control Supervisor.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
10/18 - Ongoing	**Stormwater Masterplan - East Baton Rouge Parish, LA.** *East Baton Rouge Parish.* Surveyor for hydrographic surveying of bayous and creeks located within East Baton Rouge Parish for the EBR Stormwater Masterplan. The work consists of establishing cross-sections and stream bed profiles along their length.
11/19 - 04/20	**Drainage Survey, Allen Parish, LA.** *Allen Parish.* Surveyor for survey of drainage structures located in Allen Parish.
08/19 - On going	**Amite/Blind River Survey, Livingston Parish, LA.** *Livingston Parish.* Surveyor for hydrographic surveying of the mouth of the Amite and Blind River in Livingston Parish.
01/18 – 06/19	**H.004100- I-10 (LA 415 to Essen Lane on I-10 and I-12) - East and West Baton Rouge Parishes.** *DOTD.* Survey technician for topographic survey of the work between LSU lakes and Essen Lane.
05/17 - 10/18	**H.004791.5 - Belle Chasse Bridge and Tunnel Replacement Hydrographic Survey - Plaquemines Parish, LA.** *DOTD.* Survey technician for comprehensive topographic surveying services for the Belle Chase Bridge and Tunnel Replacement project for DOTD. Included in this work was a survey performed utilizing traditional methods, terrestrial laser scanning of roadway surfaces, and multi-beam 3-D hydrographic surveying.
8/14 - On going	**H.004273.5 – I-49 Connector – Lafayette Parish, LA.** *DOTD.* Survey technician responsible for providing topographic surveying services for the I-49 Connector. The project is in a dense urban area and is approximately 5 miles long. Forte and Tablada, Inc. completed laser scanning services for much of the congested corridor as a means to obtaining topographic data without endangering surveyors.
11/18 - 04/19	**H.011684.5- LA 327 Spur: Staring Lane Extension – East Baton Rouge Parish, LA.** *DOTD.* Project surveyor for comprehensive topographic surveying services and developing a drainage map for the Staring Lane Extension project for DOTD. Included in this work was a survey performed utilizing traditional methods and terrestrial laser scanning of roadway surfaces.

Firm employed by **Forte & Tablada**			
Name	**Ross Wilson, PLS**	Years of relevant experience with this employer	➲ **8**
Title	Surveyor	Years of relevant experience with other employer(s)	➲ **2**
Degree(s) / Years / Specialization		B.S./2010/Geomatics	
Active registration number / state / expiration date		PLS 5148 / LA / 03/31/2022	
Year registered	2015	Discipline	Survey
Contract role(s) / brief description of responsibilities		**MPR 5. Survey & Mapping Support**	

Mr. Wilson is a Professional Land Surveyor licensed in the States of Louisiana, Mississippi, Texas, and Arkansas with 10 years of land surveying experience. Having experience using Civil 3D, Microstation, Inroads, CAD Conform, and Trimble Business Center, Mr. Wilson has managed and done CAD work on Property Surveys, Topographic Surveys, Right-of-Way Maps, and Construction Surveys. Certified ATSSA Registered Flagger, Traffic Control Technician, and Traffic Control Supervisor.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
05/17 - 10/18	**H.004791.5 - Belle Chasse Bridge and Tunnel Replacement Hydrographic Survey, Plaquemines Parish, LA.** *DOTD.* Surveyor for comprehensive topographic surveying services for the Belle Chase Bridge and Tunnel Replacementproject for DOTD. Included in this work was a survey performed utilizing traditional methods, terrestrial laser scanningof roadway surfaces, and multi-beam 3-D hydrographic surveying.
01/18 - On going	**H.004100- I-10 (LA 415 to Essen Lane on I-10 and I-12) - East and West Baton Rouge Parishes, LA.** *DOTD.* Project Manager for topographic survey of the work between LSU lakes and Essen Lane.
02/17 - 03/18	**H.010753.5- US 90 / I-310 Interchange, St. Charles Parish, LA.** *DOTD.* Surveyor responsible for topographic surveying and 3-D laser scanning at the intersection of US-90 and I-310 in St. Charles Parish.
08/14 - On going	**H.004273.5 – I-49 Connector – Lafayette Parish, LA.** *DOTD.* Survey Manager responsible for providing topographic surveying services for the I-49 Connector. The project is in a dense urban area and is approximately 5 miles long. Forte and Tablada, Inc. completed laser scanning services for much of the congested corridor as a means to obtaining topographic data without endangering surveyors.
03/13 - 07/15	**H.004698 – Almonaster Avenue Lift Bridge – Orleans Parish, LA.** *DOTD.* Survey Manager responsible for performing topographic and property surveys, developing a drainage map, establishing existing right-of-way for the north line of I-10, Almonaster Avenue, and CSX Railroad property, and establishing elevations to develop a Digital Terrain Model with widths matching the limits of the topographic survey.
10/18 - 02/19	**Sunshine Bridge Damage Survey, LA.** *DOTD.* Surveyor responsible for establishing control on and near the Sunshine Bridge to use survey and laser scanning methods to monitor the damage on the bridge. This project included utilizing LiDARdata.
06/19 - 09/19	**H.000303.6 - Danziger Bridge Repair, Orleans Parish, LA.** *DOTD.* Surveyor for Topographic and Monitoring survey and laser scanning of Danziger bridge. This survey is necessary due to damage of joints, deck, and girder ends of the fixed spans on both sides of the bridge. This project included utilizing LiDAR data.
1/13 - 12/13	**H.009933 – MacArthur Interchange Project Phase 1B – Orleans Parish, LA.** *DOTD.* Responsible forlaser scanning general areas in support of topographical survey, including location and elevation surveys, for redundancy and volume.
01/13 - 3/13	**H.009250 – I-10: Highland Road to LA 73 – East Baton Rouge and Ascension Parishes, LA.** *DOTD.* Survey Manager for the topographic survey of approximately 7.0 miles to widen the interstate.
10/13 – 10/14	**10/13-10/14 - H.002365.5 – LA 63: Bridges near Bluff Creek – East Feliciana Parish, LA.** *DOTD.* Provided topographic surveys in preparation for bridge replacements with drainage structures along three portions of the existing highway including utility location and depths. Finished floor elevations of all buildings that fall within the survey limits were determined.

Firm employed by **Forte & Tablada**			
Name	**Brent Campbell**	Years of relevant experience with this employer	➲ **6**
Title	Advanced Measurements and Modeling Technician	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		B.S. / 2013 / Construction Management	
Active registration number / state / expiration date		N/A	
Year registered	N/A	Discipline	Survey
Contract role(s) / brief description of responsibilities		**Survey & Mapping Support**	

Brent Campbell is well-versed in the use of 3-D laser scanning, extraction, and 3-D modeling. He is experienced with project coordination, management, review, and delivery. Brent also has experience with thermography and photogrammetry. Certified ATSSA Registered Flagger and Traffic Control Technician.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
10/19 – 10/20	**H.012485.1 - Inspection of Metal Culverts - Statewide, LA.** *DOTD.* Laser scanning technician to provide inspections and data acquisition for approximately 230 culvert locations statewide. Culvert measurements were acquired with a mixture of 3-D laser scanning, sonar, and LIDAR.
02/17 - 03/18	**H.010753.5 – US 90 / I-310 Interchange – St. Charles Parish, LA.** *DOTD.* Responsible for 3-D laser scanning at the intersection of US 90 and I-310 in St. Charles Parish. This project will allow improvements for safety and efficiency. The complete topographic survey includes all utilities with depths and all drainage required along with finish floor elevations of all buildings that fall within the survey limits.
08/14 - Ongoing	**H.004273.5 - I-49 Connector – Lafayette Parish, LA.** *DOTD.* Responsible for providing topographic surveying services for the I-49 Connector. The project is in a dense urban area and is approximately 5 miles long. Forte and Tablada, Inc. completed laser scanning services for much of the congested corridor as a means to obtaining topographic data without endangering surveyors.
01/13 - 12/13	**H.009933 - MacArthur Interchange: Project Phase 1B – Orleans Parish, LA.** *DOTD.* Responsible for laser scanning general areas in support of topographical survey, including location and elevation surveys, for redundancyand volume.
01/13 - 03/13	**H.009250 - I-10: Highland Road to LA 73 – East Baton Rouge and Ascension Parishes, LA.** *DOTD.* Responsible for laser scanning of several bridges overpassing I-10, and extracting/coding survey coordinates and alignments. Also determined minimum horizontal and vertical clearances.
03/13 - 07/15	**H.004698 - Almonaster Avenue Lift Bridge – Orleans Parish, LA.** *DOTD.* Responsible for laserscanning of Almonaster lift bridge and determination of various bridge geometrics and counterweight volume based on scan data. Provided 2-D plan geometry and elevations, as well as coded survey data. Used scanning to perform rail survey forinaccessible areas.
09/21 – 09/21	**Westbank Closure Complex Multi-Beam Hydrographic Survey, Belle Chase, LA.** *South Louisiana Flood Protection Authority – West.* Served as a technical lead for the comprehensive multibeam hydrographic scour survey.

Firm employed by **Forte & Tablada**			
Name	**Spencer Rimes**	Years of relevant experience with this employer	➲ **1**
Title	Senior Advanced Measurements Technician	Years of relevant experience with other employer(s)	➲ **12**
Degree(s) / Years / Specialization		Master of Landscape Architecture / 2009 / GIS Bachelor of Science / 2005 / Horticulture	
Active registration number / state / expiration date		N/A	
Year registered	N/A	Discipline	Survey
Contract role(s) / brief description of responsibilities		**Survey & Mapping Support**	

Spencer Rimes is a GIS/Data Analyst with 12 years of experience. He graduated from Louisiana State University with a degree in Landscape Architecture with a GIS concentration. He has experience in ArcGIS, Autocad, Microstation and Inroads Survey, Adobe Creative Suite, as well as hydrographic mapping software.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
06/13 - 04/14	**Levee Inspections, LA, TX, and IL.** *USACE.* GIS Specialist for levee system inspections. The work consists of manual inspection using a GPS-enabled tablet, recording all deficiencies and creating advanced reports, photo logs and detailed maps with their associated quality ratings.
05/14 - 08/15	**Strategic Sites Inventory Program, Statewide, LA.** *Louisiana Economic Development.* Site planning and design consultant for Louisiana Economic Development. The program consists of identifying development-ready sites and accelerating the availability of those sites for industrial and commercial development.
11/15 - 03/16	**LA 327 – Gardere Lane Topographic Survey, Baton Rouge, LA.** *DOTD.* GIS Analyst for topographic survey of drainage features and development of the existing drainage map using a combination of field-collected data and LiDAR imagery.
01/18 - 06/19	**LA 415 to Essen Lane Topographic Survey, Baton Rouge, LA.** *DOTD.* GIS Analyst for topographic and drainage survey. The work consists of field data collection of features and attributes utilizing an imaging laser scanner and creating the overall drainage network using a combination of as-built drawings and field-collected data.
09/20 - 05/21	**Hydrographic Bridge Surveys, Statewide, LA.** *DOTD.* Technical lead for multibeam surveys related to bridge scour analysis. The work consists of hardware calibration, data collection, and post-processing of survey data.
09/21 – 09/21	**Westbank Closure Complex Multi-Beam Hydrographic Survey, Belle Chase, LA.** *South Louisiana Flood Protection Authority – West.* Served as a technical lead for the comprehensive multibeam hydrographic scour survey.

Terracon Resumes

Firm employed by **Terracon**			
Name	**Steve Greaber, PE**	Years of relevant experience with this employer	➲ **13**
Title	Principal, Senior. Geotechnical Engineer	Years of relevant experience with other employer(s)	➲ **18**
Degree(s) / Years / Specialization		B.S. / 1989 / Civil Engineering	
Active registration number / state / expiration date		PE 26107 / Louisiana / 09/30/2023	
Year registered	1995	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Field Lead)**	

Mr. Greaber has over 31 years of experience working on a wide range of geotechnical projects. He has worked extensively on City-Parish projects as well as for commercial, industrial, transportation, and institutional clients. He is well versed in all aspects of geotechnical engineering and materials quality aspects of construction including earthwork, concrete, masonry, asphalt, and structural steel. Mr. Greaber has extensive experience in deep foundation analysis, implementation/interpretation of load testing, site modification and improvement techniques including but not limited to dynamic compaction, geotextile reinforced slopes, and wick drains for improvement of consolidation. Other areas of expertise include geotechnical seismic evaluations and liquefaction mitigation.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
09/20 – 04/21	**Camp Whispering Pines Dam, Independence, LA.** *Girl Scouts of Louisiana.* Mr. Greaber served as a project reviewer for the project that included a subsurface investigation and geotechnical site characterization report concerning the existing dam and levee at the Camp Whispering Pines facility. It was observed that considerable erosion was occurring on the downstream side of the existing dam spillway.
11/19 – 04/21	**Bayou Lafourche Weir, Thibodaux, LA.** *Bayou Lafourche Freshwater District.* Mr. Greaber served as a project reviewer for the project. Terracon provided the geotechnical field exploration, laboratory testing and slope stability analysis. He was responsible for developing the soil profile and performing the stability analysis utilizing Slope/W software. He performed slope stability analysis for the existing Bayou Lafourche cross-section as well as the improved cross-section to help ensure stability of the side-slopes post construction. The stability analysis incorporated ground improvement methodology by including the effects of a geosythetic fabric.
06/17 – 10/18	**H.010006: Bayou Petit Caillou Bridge Improvements, Chauvin, LA.** *DOTD.* Mr. Greaber served as the Senior Geotechnical Engineer in the subsurface evaluation and substructure design for upgrades to the existing bridge. The services were performed for Huval and Associates through their Bridge Preservation Contract and included providing pile recommendations for support of a new bridge lift operators building and supports for traffic barriers and fender replacements.
04/17 – 04/20	**The Lakes at White Oak Dam and Spillway, Baton Rouge, LA.** *The Lakes at White Oak HOA.* Mr. Greaber served as project reviewer for the project. Terracon performed independent inspection of two weirs, a report of the findings, and a maintenance work scope package.
07/18 – Ongoing	**H.011235.5: I-49 South @ Verot School Road US 90, Lafayette, LA.** *DOTD.* Mr. Greaber is serving as the lead design engineer for the subsurface evaluation and geotechnical engineering design for the US 90 (I-49 South) Design Build Project. Terracon provided the design of the substructure of two bridges and global stability and settlement for several MSE walls to be constructed as part of this design build project. Terracon developed nominal capacity and resistance factors for pile foundations for the bridge substructures and developed driving criteria using WEAP analysis for the proposed pile driving equipment. Dynamic Pile Testing was performed during construction to verify pile capacities. Terracon reviewed the CAPWAP results and provided recommendations for adjustment of the resistance factors to accommodate slight variations in nominal capacity obtained at each bent.

Firm employed by **Terracon**			
Name	**Lynne Roussel, PE**	Years of relevant experience with this employer	**➲ 16**
Title	Geotechnical Department Manager	Years of relevant experience with other employer(s)	**➲ 0**
Degree(s) / Years / Specialization		M.S. / 2005 /Geotechnical Engineering B.S. / 2003 /Civil Engineering	
Active registration number / state / expiration date		PE 35152 /Louisiana / 03/31/2022	
Year registered	2009	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Field Support)**	

Ms. Roussel has managed geotechnical projects for 16 years. She has performed engineering analyses using in-house computer resources as well as commercial software used for settlement analysis, deep foundations analysis, pavement design, slope stability analysis, and lateral loading of deep foundations. Ms. Roussel also performed analyses for the USACE for limiting pressure analyses for Horizontal Directional Drilling (HDD) projects, seepage analyses and Method of Planes slope stability. Her software experience includes the following software: PCSTABL6, GEOSLOPE, LPILE, DRIVEN, SHAFT, Shoring Suite, WINPAS and Darwin.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
04/17 – 08/20	**The Lakes at White Oak Dam and Spillway, Baton Rouge, LA.** *The Lakes at White Oak HOA.* Ms. Roussel served as project manager for the project. Terracon performed independent inspection of two weirs, a report of the findings, and a maintenance work scope package.
11/19 – 04/21	**Bayou Lafourche Weir, Thibodaux, LA**: *Bayou Lafourche Freshwater District. Ms*. Roussel served as a project engineer for the project. T Terracon provided the geotechnical field exploration, laboratory testing and slope stability analysis. Ms. Roussel served as Terracon project manager for this project. She was responsible for coordinating the field exploration and lab testing. She also helped developed the soil model utilized in the stability analysis. She also determined which stability cases (e.g., undrained, drained, stockpiles, etc.) needed to be analyzed based on her understanding of the project requirements.
01/12 – 01/13	**H.009187.5 23rd Street Bridge over Canal No. 17, Jefferson Parish, LA.** *DOTD.* Ms. Roussel has served as project engineer in the subsurface evaluation and engineering design of this DOTD Off System Bridge project. The bridge at 23rd Street over Canal No. 17 was replaced. DOTD boring logs and LRFD Pile Calculations were provided to the design engineer.
01/10 – 01/12	**H.0051 21 LA-1 to I-10 Connector, Port Allen, LA.** *DOTD.* Ms. Roussel served as project manager for the design of a new connector between LA 1 and I-10 near the Intracoastal Canal in West Baton Rouge Parish, Louisiana. The project consisted of a bridge over the Intracoastal Canal, a flyover connector to LA-1 and associated roadway. Soil borings and Cone Penetrometer Test (CPT) probes associated with the bridges and roadway were completed. All calculations were consistent with DOTD pavement design standards. Settlement analysis was performed for the approach embankments. Pile capacities were also provided for the elevated structure.
05/18 – 09/20	**H.011235.5 I-49 South @ Verot School Road US 90, Lafayette, LA.** *DOTD.* Ms. Roussel served as project manager. She oversaw the design of the substructure of two bridges and global stability and settlement for several MSE walls to be constructed as part of this design build project. Terracon developed nominal capacity and resistance factors for pile foundations for the bridge substructures and developed driving criteria using WEAP analysis for the proposed pile driving equipment.

Firm employed by **Terracon**			
Name	**Matt Minton**	Years of relevant experience with this employer	➲ **19**
Title	Department Manager, Laboratory Services	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		N/A	
Active registration number / state / expiration date		N/A	
Year registered	N/A	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Field Support)**	

Mr. Minton has 19 years of experience in laboratory testing and construction QA/QC testing for geotechnical projects, civil construction and landfill construction. Mr. Minton currently serves as the Laboratory Manager of Terracon's Baton Rouge full-service geotechnical and construction materials laboratory. Mr. Minton has worked diligently to implement a complete QA process for all the laboratory tests conducted in our laboratory. Under his supervision, the Baton Rouge laboratory has maintained its LDEQ LELAP, USACE, and AASHTO (AMRL and CCRL) certifications.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
09/20 – 04/21	**Camp Whispering Pines Dam, Independence, LA.** *Girl Scouts of Louisiana.* Served as lab manager for the project.
11/19 – 04/21	**Bayou Lafourche Weir, Thibodaux, LA.** *Bayou Lafourche Freshwater District.* Served as lab manager for the project.
06/19 – 01/20	**H.004100: I-10- Widening East Baton Rouge Parish, LA.** *DOTD.* Served as lab manager on this project.
07/18 – 10/18	**H.011235.5: I-49 South @ Verot School Road US 90, Lafayette, LA.** *DOTD.* Served as lab manager on this project.
06/18 – 08/18	**H.005967.5: Nelson Rd. Extension and Bridges, Calcasieu Parish, LA.** *DOTD.* Served as lab manager on this project.
06/17 – 02/18	**H.002980.5: I-10 Overpass US 165 & MPRR Project, Iowa, LA.** *DOTD.* Served as lab manager on this project.
03/17 – 04/17	**H.001140 LA 124: Hooter Creek Bridge, Jena, LA.** *DOTD.* Served as lab manager on this project.
06/20 – 01/21	**H.005121 LA-1 and LA-415 Connector, Port Allen, LA.** *DOTD.* Served as lab manager on this project.

Firm employed by **Terracon**			
Name	**Brian Alexander**	Years of relevant experience with this employer	➲ **15**
Title	Drilling Operations Manager	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		M.A. / 1999 / Physical Therapy	
Active registration number / state / expiration date		N/A	
Year registered	N/A	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**Geotechnical Services (Field Support)**	

Mr. Alexander manages the geotechnical drilling operations for Louisiana and Mississippi. He coordinates logistics/scheduling of projects between the six offices in both states, and also assists neighboring states in project coordination when it is needed. His approach to increased field safety has earned him safety awards at the division and national level. Mr. Alexander has met the Louisiana DOTD work zone training requirements of Traffic Control Supervisor and the Traffic Control Flagger Instructor.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
09/20 – 04/21	**Camp Whispering Pines Dam, Independence, LA.** *Girl Scouts of Louisiana.* Mr. Alexander has supervised drill crews.
11/19 – 04/21	**Bayou Lafourche Weir, Thibodaux, LA.** *Bayou Lafourche Freshwater District.* Mr. Alexander has supervised drill crews.
06/19 – 11/19	**H.004100: I-10- Widening East Baton Rouge Parish, LA.** *DOTD.* Mr. Alexander has supervised drill crews and worked in the field as a logger.
05/18 – 06/18	**H.005967.5: Nelson Rd. Extension and Bridges, Calcasieu Parish, LA.** *DOTD.* Mr. Alexander supervised drill crews and worked in field as a logger for water borings.
10/18 – 07/19	**H.011235.5: I-49 South @ Verot School Road US 90, Lafayette, LA.** *DOTD.* Mr. Alexander has supervised drill crews.
02/10 – 5/11	**LA 1/Interstate 10 Connector, LA.** *DOTD.* Mr. Alexander has supervised drill crews.
05/08 – 03/09	**I-12 Widening – East Baton Rouge and Livingston Parishes, LA.** *DOTD.* Mr. Alexander served as field supervisor for this contract.
11/04 – 07/12	**Off System Bridges, Various Locations, LA.** *DOTD.* Mr. Alexander has supervised drill crews and worked in the field as a logger on several of these projects.
01/17 – 01/17	**H.001140 LA 124: Hooter Creek Bridge, Jena, LA.** *DOTD.* Mr. Alexander served as field supervisor for this project.
05/17 – 08/17	**H.002980.5: I-10 Overpass US 165 & MPRR Project, Iowa, LA.** *DOTD.* Mr. Alexander served as field supervisor for this project.

Firm employed by **Terracon**			
Name	**Rachel Keane**	Years of relevant experience with this employer	➲ **3**
Title	Senior Staff Scientist	Years of relevant experience with other employer(s)	➲ **20**
Degree(s) / Years / Specialization		B.S. / 1997 /Limnology	
Active registration number / state / expiration date		Wetland Delineation, USACE 1987 Manual Federal Energy Regulatory Commission, Environmental Compliance and Report Writing Federal Highway Administration, NEPA and Transportation Decision Making Advisory Council for Historic Preservation, Section 106 Essentials	
Year registered	N/A	Discipline	Environmental
Contract role(s) / brief description of responsibilities		**Environmental Support**	

Ms. Keane meets the qualifications of an Environmental Professional as defined by EPA's AAI. With 23 years of experience, she has performed all aspects of Phase I ESA's including site reconnaissance and report preparation for sites throughout the Southeast. She has also been a contributing writer of documents required by the National Environmental Policy Act (NEPA) as well as Phase I Environmental Site Assessments (ESAs), and threatened and assisted in natural resources surveys for various projects. Ms. Keane has completed +200 Phase I ESAs and has assisted in multiple Phase II ESAs.

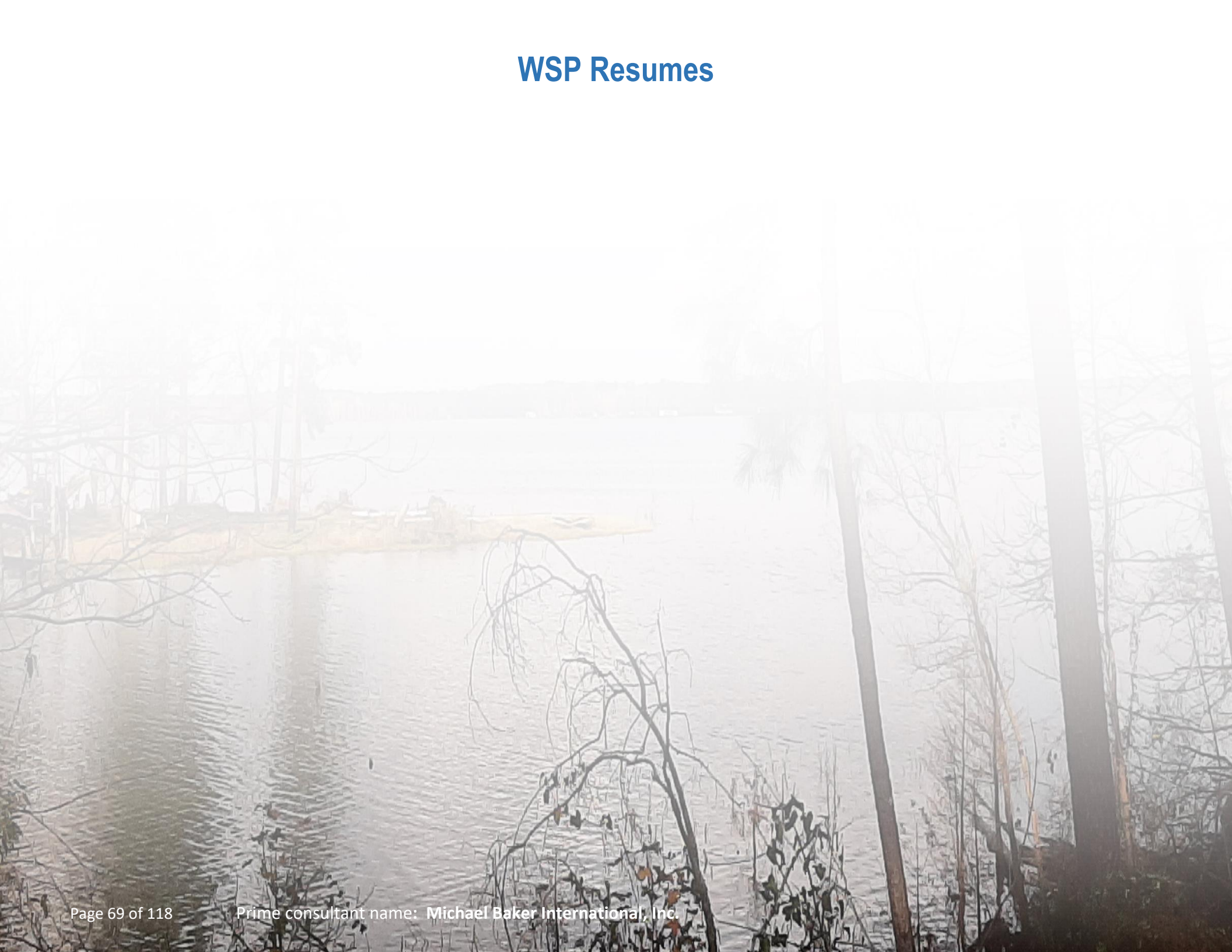
Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
02/18 - Present	**Acquisition, Construction, and Disposition Projects, New Orleans, LA.** *New Orleans Redevelopment Authority.* Ms. Keane is currently acting as Project Manager and main Point of Contact for the New Orleans Redevelopment Authority (NORA) in support of Terracon's contract with NORA to provide NEPA and Environmental Review Record (ERR) documentation for several HUD programs.
10/18 – 05/19	**Four Scattered Residential Lots, Mandeville and Covington, LA.** *Habitat for Humanity St. Tammany West.* Ms. Keane is currently acting as Project Manager and main technical writer for the Habitat for Humanity St. Tammany West to provide NEPA and Environmental Review Record (ERR) documentation for the construction of four single-family residential properties. The projects were evaluated in two separate ERR documents proposed to be partially funded using HOME grant funds provided by HUD.
07/18 – 08/18	**Portfolio of 11 Properties, Phase I Environmental Site Assessment, Lafayette, LA.** *Frank's International.* Ms. Keane was the Project Manager and Environmental Professional responsible to provide Phase I Environmental Site Assessments (ESA) services for 11 of a total of 23 properties proposed for acquisition. Ms. Keane also facilitated Terracon's limited asbestos sampling, and visual mold observation services for these properties as well. The properties proposed for evaluation ranged from equipment storage and laydown yards to active equipment manufacturing and preparation operations. Phase I ESA services were conducted in accordance with ASTM E1527-13, Standard Practice for Environmental Site Assessments: RECs were identified in connection with eight (8) of the 23 properties including, but not limited to, historic use of halogenated solvents, identified on-site and adjoining underground storage tanks (USTs), and on-site and off-site printing activities.
02/18 - Present	**Renovation and New Construction, Various Grant Programs for 2016 Flooding Recovery, Statewide, LA.** *Louisiana Housing Corporation.* Ms. Keane acted as the Program Manager, principal technical writer, and Team Leader for the preparation of EA and Tier II ERRS in support of various grant programs administered by the Louisiana Housing Corporation (LHC) for renovation and recovery funding for the March and August 2016 flood events in Louisiana. These programs included Neighborhood Landlord, Multifamily, Baton Rouge Rebuilds, and Baton Rouge Rebuilds Developers grant funding. Ms. Keane also trained junior staff and guided the preparation of 100+ EAs and Tier II ERRs.
02/20 – 08/20	**Four Residential Projects, Lafayette, LA.** *Habitat for Humanity.* Ms. Keane served as the Project Manager and principal technical writer to prepare the Phase I ESA and EA in compliance with HUD and NEPA for the construction of four (4) single-family residences on contiguous parcels in Lafayette, Louisiana. The Phase I ESA was conducted in compliance with the appropriate ASTM Standard. Resources assessed for the EA included, but was not limited to, historic resources, endangered species, floodplain impacts, and other natural and community resources. No issues of concern were identified for either the Phase I ESA or the EA.

Firm employed by **Terracon**			
Name	**Rebecca Gaspard**	Years of relevant experience with this employer	➲ **4**
Title	Staff Scientist	Years of relevant experience with other employer(s)	➲ **0**
Degree(s) / Years / Specialization		B.S. / 2016 /Environmental Masters Certificate / 2021 / Coastal Sciences	
Active registration number / state / expiration date		38 Hour Army Corps of Engineers Wetland Delineator 40 Hour OSHA HAZWOPER E-Rail Safe Certified	
Year registered	N/A	Discipline	Environmental
Contract role(s) / brief description of responsibilities		**Environmental Support**	

As an environmental scientist, Ms. Gaspard works on Phase I Environmental Site Assessments (ESAs), National Environmental Policy Act (NEPA) Reviews, Phase II Subsurface Investigations, wetland delineations, permitting, mitigation and many other types of environmental projects. Responsibilities have included: project management, development of project documents, implementation of field work, report writing, and communication with clients and regulatory agencies.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
11/17 – Ongoing	**Off System Bridge Replacements, Southeast, LA.** *DOTD.* Project Manager. field services, and reporting. Terracon's team has teamed with several entity's for DOTD off system bridge replacements. Ms. Gaspard has performed Waters of the United States (WOTUS) delineations for DOTD OSB replacement projects throughout Louisiana. Additionally, she has prepared and obtained several USACE jurisdictional determinations, nationwide permits, and no permit required determinations
09/19 – 06/20	**Violet Container Terminal, St. Bernard, LA.** *Port of New Orleans.* Project Manager. Field services, and reporting. Terracon was engaged to perform various environmental services on a 1,300-acre parcel of land in southeast, Louisiana. Ms. Gaspard led Terracon's team through the Phase I ESA, Phase II LSI, desktop cultural resources, and desktop wetland assessment. Based on the findings of these environmental services, Terracon recommended performing a full Waters of the Unites States (WOTUS) Delineation and Louisiana Rapid Assessment Method (LRAM) study. Ms. Gaspard and a team of Terracon employees mobilized to the site and fully delineated the site. Based on the findings of the WOTUS Delineation, Terracon determined that approximately 1,170 acres of the site were jurisdictional wetlands. The LRAM study further assisted the client to determine anticipated mitigation costs.
04/20 – 12/20	**Environmental Services, Merryville, LA.** *Merryville Aggregates.* Project Manager. Field services, and reporting. Terracon performed a forensic delineation on a ±100-acre tract of wooded land located Vernon Parish, Louisiana. The delineation identified ± 20 acres of forested wetlands, ± 3,450 linear feet of streams, ±6.3 acres of waters and ±8.6 acres of wetlands. A jurisdictional determination request was submitted to the USACE. Prior to the delineation, much of the site had been clear cut. Terracon coordinated with Professional Wetlands Scientists throughout the region to accurately delineate the site.
10/18 – Ongoing	**Environmental Services, Various Locations, LA.** *Love's Travel Stops & Country Stores.* Project Manager. Field services, and reporting. Terracon Consultants, Inc. was engaged to perform various Waters of the United States (WOTUS) delineations, section 404 and 401 permitting, mitigations, and water quality certifications throughout the Red River basin, through the Mississippi Delta, and over to the Chickasawhay River. Projects have ranged in size from approximately ten to forty acres with nationwide and individual permitting. A specific project example include is Love's DeSoto. Terracon performed a delineation on a ±35-acre tract of wooded land located at the northwest corner of Highway 84 and Interstate 49 in Mansfield, DeSoto Parish, Louisiana. The delineation identified ± 20 acres of forested wetlands, ± 1,000 linear feet of ephemeral streams, and ±1,000 linear feet of Mundy Bayou. A jurisdictional determination request was submitted to the United States Army Corps of Engineers (USACE). The USACE concurred with the delineation results and issued a determination prior to the Navigable Waters Protection Rule (NWPR). Subsequently, work began on an individual permit application. Terracon consulted with the client and their civil engineer Resource Consulting Civil Engineering (RCCE) to develop an avoidance and minimization plan. Additionally, Terracon assisted with communications with the USACE and the client which resulted in the change of the jurisdictional determination under the new NWPR, ultimately reclaiming three ephemeral streams. The project is currently in the final stages of planning. Terracon is maintaining communication with the USACE and is beginning to implement a mitigation plan.

WSP Resumes



Firm employed by **WSP**			
Name	**Tom Edwards, PE**	Years of relevant experience with this employer	**➲ 3**
Title	Water Resource Engineer	Years of relevant experience with other employer(s)	**➲ 14**
Degree(s) / Years / Specialization		B.S. / 2004 / Civil Engineering	
Active registration number / state / expiration date		098413 New York / 12/31/2022	
Year registered	2016	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 6, b and c. Hydrology & Hydraulics**	

Tom Edwards is a Water Resources Engineer and a Professional Engineer (PE) with extensive engineering and management experience on large and small scale domestic and international projects. Mr. Edwards has comprehensive experience of hydrology and hydraulic studies, flood and dam breach studies, dam safety inspections and potential failure mode analysis, stormwater management projects, coastal and inland flood studies, and flood hazard classification assessments. Tom has worked extensively on NYSDEC and FERC regulated dams and has participated in Part 12D safety inspections and potential failure mode analysis workshops for large high hazard dams. Tom's technical expertise includes hydraulic and hydrologic modeling, dam breach modeling and inundation mapping, flood consequence modeling, dam safety inspections and condition assessments, and assessment of beyond design-basis events, including extreme rainfall analyses and site-specific PMP studies. Tom has applied expertise in modeling and analysis using HEC-HMS, HEC-SSP, HEC-RAS, HEC-FIA and HEC-FDA, he has trained on the use of LifeSim.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
08/20 – Ongoing	**Baxter Preserve Pond Dam Remediation Design, Westchester County, NY.** *North Salem Open Land Foundation.* As Project Engineer, Tom completed hydrologic and hydraulic analysis to determine the existing spillway's ability to safely convey the spillway design flood and additional drawdown criteria required by the NYSDEC dam safety regulations. Modeling was performed using HEC-HMS, HEC-SSP, and HEC-RAS2D. Tom prepared the Engineering Assessment Report Addendum to address additional H&H and stability issues.
07/18 – 12/20	**Lake Suzanne Dam Rehabilitation Design, Rockland County, NY.** *Rockland County Drainage Agency*. Project Engineer completing quality assurance reviews of the stability analysis for the new labyrinth spillway required to safely pass the spillway design flood, and permitting applications to USACE and NYSDEC addressing dam safety, wetlands, historic preservation, and endangered species concerns.
03/18 – 09/21	**Congaree River Hydraulic Analysis, Columbia, SC.** *Apex Companies.* Project engineer developing 1D and 2D HEC-RAS hydraulic models to analyse the impact of rockfill cofferdam options for environmental remediation work within the river. The existing FEMA model was obtained and refined, before a no-rise analysis was completed to determine impacts of structures on extreme flood levels, in addition to typical flow conditions. A 2D HEC-RAS model of the channel was also developed to assess changes in velocity and impacts on river bed/bank erosion.
05/18 – Ongoing	**Dam Safety Support, City of Beacon, NY.** *City of Beacon.* Project Engineer for the rehabilitation design of Mount Beacon Dam a 100-year old masonry and concrete dam, completing hydrology & hydraulics and stability analyses. Modeling was performed using HEC-HMS, HEC-SSP, and HEC-RAS2D. Prepared design report and construction specifications in addition to joint permit application to NYSDEC and USACE.
08/17 – 10/20	**Dam Safety Support, Morristown, NJ.** *Eagle Creek Renewable Energy (ECRE).* Supported ECRE's engineering staff in performing dam safety activities for all of the projects in the Mongaup System consisting of Rio, Mongaup Falls, Toronto, and Swinging Bridge Dams. Prepared STID updates for Cliff Lake Dam and Toronto Dam incorporating new data, analyses and correspondence. Prepared a work plan for an updated inflow design flood study for the Mongaup River projects including a site-specific PMP analysis, two-dimensional flood routing and incremental hazard evaluation.
05/18 – 07/19	**Chiselhurst Dam Rehabilitation, Chappaqua, NY.** *Tercia Lake Owners Association*. Project engineer for the rehabilitation design of the existing concrete dam, completed hydrology & hydraulic analyses, reviewed stability analyses for the current conditions and proposed remediated dam, assisted with the preparation of construction specifications, and design drawings, and prepared the design report for submittal with the permit application. Modeling was performed using HEC-HMS, HEC-SSP, and HEC-RAS2D.
03/16 – 08/17	**Bagnell Dam FERC Part 12 Responses, Ameren Missouri, Lake of the Ozarks, MO.** *Ameren Missouri*. Project engineer for analysis of the December 2015 flood event using gaged rainfall, stage, and flow data in comparison with the existing hydrological analyses to address questions from the FERC regarding Ameren's dam operation and management of the flood event.
05/14 – 08/17	**OGS Dam Hazard Reclassification, Albany, NY.** *New York State Department of Environmental Conservation.* Lead engineer responsible for overseeing additional hydrological and hydraulic analyses to inform detailed dam breach inundation modeling for five dams. The scope of work included steady- and unsteady-state hydraulic

	modeling, utilizing 1D and 2D models, to simulate dam failures and produce inundation mapping to determine if the hazard classifications should be upgraded. Modeling was performed using HEC-HMS, HEC-SSP, and HEC-RAS2D.
09/15 – 01/17	**Glenwood Lake Dam Breach Inundation Mapping, Westchester County, NY.** *City of New Rochelle.* Project engineer preparing breach analysis calculation including inundation mapping. Due to the flat topography and urbanized nature of the area, a FLO-2D two-dimensional model was utilized to determine extents of inundation and evaluate time lag between failure and inundation. Hydrological analysis was also completed to determine the inflow to the lake during flood events. Performed flood consequence analysis for breach scenarios.

Firm employed by **WSP**			
Name	**Ahintha Kandamby, PhD, PE**	Years of relevant experience with this employer	➲ **1**
Title	Lead Water Resources Engineer	Years of relevant experience with other employer(s)	➲ **11**
Degree(s) / Years / Specialization		Ph.D. / 2013 / Civil & Environmental Engineering M.S. / 2008 / Civil & Environmental Engineering B.S. / 2004 / Mechanical Engineering	
Active registration number / state / expiration date		100685-1 / New York / 11/30/2023	
Year registered	2017	Discipline	Civil
Contract role(s) / brief description of responsibilities		**MPR 6, b and 6c. Hydrology & Hydraulics**	

Ahintha is a subject matter expert with expertise in developing and working with 1D, 2D, and 3D hydrodynamic models in riverine, coastal, and infrastructure design applications. His expertise includes 1D and 2D modeling using HEC-RAS, 3D (CFD) modeling using FLOW-3D, sediment transport modeling, hydrologic modeling using HEC-HMS and HEC-SSP, flood consequence modeling using HEC-FIA and FDA, and reservoir operations modeling using HEC-ResSim. Ahintha has expertise in complex modeling for dam infrastructure, including spillways, reservoirs, gates, dam breach analysis, and receiving waters. His expertise includes Federal Emergency Management Agency flood insurance programs, computational fluid dynamics model development for complicated hydraulic projects. He has performed 2D and 3D coupled cohesive and non-cohesive sediment transport, riverine computational fluid dynamics modeling of complex flow scenarios, probable maximum precipitation calculation for spillway designs for dams, flood risk and flood consequence assessments.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
06/21 - 01/22	**Narrows Dam, Badin, NC.** *Cube Hydro.* CFD modeling lead to evaluate the emergency spillway of the Narrows hydroelectric power Dam. CFD modeling to perform the PMF on the emergency. Modeling complicated downstream boundary conditions and large inflow discharges conditions, to evaluate scour potential, hydraulic jump formation, and downstream embankment overtopping using CFD simulations.
02/19 - 06/21	**Harwood's Mill Dam SDF Simulation, Newport News, VA.** *City of Newport News.* Engineer. Developed a full domain CFD model to simulate the Spillway Design Flood through Harwood's Mill Dam in Poquoson River in York County Virginia. Full CFD analysis of transient hydraulic jump development to ensure the adequacy of the existing concrete spillway chute. Pre- and post- processing of turbulent CFD simulation with air entrainment.
08/16 - 02/19	**Dam Safety Support, Re-classification of High Hazard Dams, NY.** *New York State Canal Corporation.* Engineer. Performed hydrology and hydrodynamic analysis for high hazard dams in the Erie Canal water supply system owned by the New York State Canal Corporation. Modeled Erie Canal Lock E-4, Lock E-29, Lock E-32, and Lock E-33. Performed HEC-RAS dam breach and hazard classifications for Erieville, Kingsley, and Mud-Lock Dams. Conducted frequency analysis using LP3 methods, HEC-HMS & HEC-SSP modeling, spillway design flood and probable maximum flood flow calculations, spillway capacity, and reservoir outlet capacity calculations. He completed a compliance check of spillway and culvert structures and completed unsteady breach modeling using HEC-RAS. Ahintha carried out model calibration and validation using available gauge data and conducted HEC-RAS unsteady simulations for "sunny day" and "sunny day breach," half probable maximum flood and half probable maximum flood breach runs to investigate the possible inundation. He prepared engineering assessment reports, flood inundation mapping, HEC-FIA flood consequence analysis and emergency action plans.
03/15 - 11/18	**Dam Engineering Services, Greece, NY.** *Town of Greece.* Lead modeler for the hydrology and hydraulics for Maiden Lane Detention Pond Dam, English Road Detention Pond Dam, Round Pond Detention Pond Dam, and Larking Creek Dams. Prepared HEC-HMS models of rainfall-runoff hydrographs and determined the spillway design floods per hazard classification. He developed 1D and 2D unsteady HEC-RAS models to analyze the SDF and SDF breach conditions to prepare the inundation maps. Performed dam breach consequence analysis using HEC-FIA.
02/15 - 07/16	**Engineering Services, Indian Lakes Dam, Virginia Beach, VA.** *Department of Conservation and Recreation.* Engineer. Conducted a visual inspection and a Hazard Potential Classification Assessment on dam spillways #21 and #42 per guidance document DCR-VSWCB-039 that included Dam Break Inundation Zone mapping developed following DCR-VSWCB-038. The Hazzard Potential Classification Assessment and Dam Break Inundation Zone were completed with the assistance of a digital terrain model and with survey and bathymetric information.
08/13 - 02/16	**Flat Rock Dam and Manayunk Schuylkill Canal Intake Structure and Spillway Improvements, PA.** *Lower Merion Township.* Performed hydraulic and hydrology modeling for the development of an operational hydrodynamic model using 2D HEC-RAS and adaptive hydraulics and computational fluid dynamics model development using flow-3D in Schuylkill River near the Flat Rock Dam. Ahintha helped with the existing model calibration and validation that were completed using Federal Emergency

	Management Agency Federal Inspection Services data. Modeled the existing conditions using Civil 3D, including the dam, the lateral waste weir, and the isolated feeder gates. He developed a computational fluid dynamics model in Flow-3D to evaluate the designed infrastructure. The project aimed to compare velocity and bed shear stress contours for the existing and proposed geometries as well as to study sediment transport with the proposed conditions.
03/14 – 06/15	**Hinckley Reservoir Regulation Services, NY.** *New York State Canal Corporation.* Contributed as a lead hydraulic and hydrology modeler for enhancements and updates to the operational support tool. Ahintha developed reservoir operation models using HEC-ResSim and HEC-ResPRM to optimize the reservoir operations. He performed a simulation of the 2015 actual operations using the enhanced version and calculated lost generation revenue and compensated revenue associated with compensable deviations from the 2012 operating diagram.

Firm employed by **WSP**			
Name	**Jeff Barnard**	Years of relevant experience with this employer	➲ **2**
Title	Hydro-Mechanical Lead Engineer	Years of relevant experience with other employer(s)	➲ **19**
Degree(s) / Years / Specialization		B.S. / 1999 / Civil Engineering	
Active registration number / state / expiration date		N/A	
Year registered	N/A	Discipline	N/A
Contract role(s) / brief description of responsibilities		**Dam Analysis and Design (Flood Gates)**	

Jeff is a Senior Professional Engineer with experience in engineering management, technical specification review, business development, heavy manufacturing, field installation and design of various hydro-mechanical equipment (water control gates and hoists) for hydroelectric, irrigation, flood control, water and wastewater treatment plants, and storm water management systems for green and brown field installations. Jeff has worked on a variety of projects including gate / hoist rehabilitation and life extension projects, condition assessments, gate / hoist design, inspection and testing. He has gained considerable experience on projects involving equipment replacement in existing hydraulic structures.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
08/20 - 01/22	**Nairn Station Hydro Project, Ontario, Canada.** *Vale Limited.* Project Engineer and Lead Hydro-mechanical Engineer. Provided project discipline engineering coordination of design phase for station re-development (replacement of spillway, overflow weir and powerhouse). Provided the engineering design of all gate and hoist equipment for the project. Equipment included spillway roller gates and electric wire rope hoists, intake and tailrace stoplogs with follower beams, emergency tailrace roller gates and electric wire rope hoists, intake trashracks. Additional responsibilities included specification preparation for the trashrack cleaning machine.
08/19 - 01/22	**Prospect 3 Hydro Penstock Replacement, OR.** *Pacificorp.* Lead Hydro-mechanical Engineer. Provided the mechanical engineering design, evaluation, specifications and fabrication drawings for two replacement sections of above ground wood stave penstocks (approximately 5200 feet and 800 feet respectively) with new steel pipe using a flexible-restrained coupling system. Provided mechanical design for minimum flow by-pass pipe and stainless-steel automated weir gate.
01/20 - 01/22	**Kerr Dam Spillway Engineering Support, OK.** *Ameren Missouri.* Lead Hydro-mechanical Engineer. Provided engineering evaluation and preliminary design for installing automatic gate operators at the Kerr Dam spillway. This evaluation included a budgetary cost estimate for fabricating and installing 17 the automatic gate operators and associated estimated equipment fabrication for the existing tainter gates.
10/17 - 04/20	**Red Rock Hydro Project, IA.** *USACE.* Project Engineer. Oversee design of all gate and hoist equipment for new power station. Equipment included intake roller gate with hydraulic cylinder hoist, intake trashracks, intake stoplogs and follower beam, draft tube stoplogs and follower beam and all associated embedded parts. Provided installation support to client.
12/16 - 01/19	**Forrest Kerr Hydro Electric Project, British Columbia.** *AltaGas.* Project and Design Engineer. Oversee design of all gate and hoist equipment for new power station. Design Engineer for intake roller gate and course screen trashrack, draft tube stoplogs and follower beam and associated embedded parts. Equipment included spillway radial gate with hydraulic cylinder hoist, intake roller gate and course screen trashrack, forebay stoplogs, forebay fine screen trashracks, draft tube stoplogs and follower and all associated embedded parts. Provided installation guidance to client.
09/16 - 12/17	**Clarence Cannon Dam Overshot Gate, Monroe City, MO.** *USACE.* Design Engineer responsible for flood control overshot gate and cable hoist for a new flood control structure located in Missouri as part of Mark Twain Lake. Provided manufacturing and installation support to the US Army Corps of Engineers during construction of this major flood control structure on the Salt River.
04/16 - 02/17	**Coachella Irrigation Canal, Coachella Valley Water District, CA.** *Coachella Valley Water District.* Design Engineer. Responsible for all gate and hoist equipment for irrigation system. Equipment included radial gates with wire rope hoists, support structures and associated embedded parts.
03/13 - 12/15	**Indian River Lagoon C-1 Diversion Project, FL.** *St Johns River Water Management District.* Design Engineer responsible for all gate and hoist equipment for water control structure for the St. John River Water Management District. Equipment included overshot gate with solar powered wire rope hoist, support structure and associated embedded parts.
01/10 - 08/12	**Fish Screen Hoist Improvements, Grimes, CA.** *Reclamation District 108.* Engineering design and analysis for hoist safety improvements for 11 cable hoists. Improvements included custom torque limiter to protect the hoist from sudden debris overload conditions, position encoder and testing verification plan.

Firm employed by **WSP**			
Name	**Gregg Hudock, PE**	Years of relevant experience with this employer	**➲ 29**
Title	Principal Geotechnical Engineer	Years of relevant experience with other employer(s)	**➲ 0**
Degree(s) / Years / Specialization		M.S./1998/Civil Engineering B.S./1996/Civil Engineering	
Active registration number / state / expiration date		PE 027465 / Georgia / Expiration Date 12/31/2022	
Year registered	2001	Discipline	Geotechnical
Contract role(s) / brief description of responsibilities		**QA/QC Support**	

Gregg Hudock is a Senior Consultant and Principal specializing in the integration of water resources and geotechnical engineering into geo-environmental projects. As both a geotechnical engineer and water resources engineer, he serves the critical roles of liaison for both disciplines during large design projects. His area of expertise is in the field of dam engineering and he has been the lead designer for roller compacted concrete (RCC) dams, RCC spillways, and concrete chute spillways for the over a decade. His experience includes extensive use of hydrologic and hydraulic modeling software and scaled laboratory hydraulic models to improve proposed design solutions.

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the time specified in the applicable MPR(s).
01/00 – 01/04	**Gwinnett County NRCS Yellow River Dam No. 14, GA.** *Gwinnett County Department of Water Resources.* Assisted the NRCS and Gwinnett County in the geologic investigation, hazard assessment, and remedial upgrade of this earthen embankment dam and its earthen emergency spillway with a roller compacted concrete (RCC) spillway. The structure is an aging flood control dam located north of Atlanta, Georgia in an urbanized watershed. Designed the embankment modification using a RCC overtopping stepped spillway which routes the full PMP storm through the watershed. Resident engineer throughout construction.
07/18 – Present	**Russell Creek Reservoir Project, GA.** *Etowah Water & Sewer Authority.* Project Manager and lead design engineer for a 110 ft. tall earthen dam that will impound approximately 1.4 billion gallons of water. The structure will be a water supply reservoir for the Etowah Water and Sewer Authority and will be a pump storage structure relying on the Etowah River and the reservoir storage to prior 17 million gallons per day. The project will involve removal of the existing NRCS Etowah River Dam No. 13 watershed structure and replacement with the Russell Creek Reservoir Dam. Project involves updating the Watershed Plan and an Environmental Assessment, permitting, and design of the dam embankment and outlet works in compliance with NRCS TR-60 and Georgia design criteria.
01/04 – 01/06	**Gwinnett County NRCS Yellow River Dam No. 16, GA.** *Gwinnett County Department of Water Resources.* Resident engineer during construction activities for the rehabilitation of this NRCS Structure designed by the U.S. Army Corps of Engineers. Provided construction quality assurance and technical oversight throughout construction. Performed geotechnical evaluation of the dam foundation during construction and redesign services related to poor foundation conditions.
04/15 – 12/21	**Palmetto Creek Dam No. 1 – Hamilton, GA.** *Georgia Soil & Water Conservation Commission.* Project Manager and lead design engineer for the dam assessment, supplemental watershed plan update, environmental evaluation (Plan EE), and rehabilitation design for a watershed structure in Harris County, Georgia. Rehabilitation design involves construction of a labyrinth weir and concrete chute overtopping the existing dam and a concrete cantilever cutoff wall in the auxiliary spillway. Project reviews completed by the NRCS National Water Management Center and the NRCS Design, Construction, and Soil Mechanics Center.
07/02 – 06/11	**Gwinnett County NRCS Big Haynes Creek Dam No. 3, GA.** *Gwinnett County Department of Water Resources.* Evaluated the NRCS structure for compliance with the Georgia Rules for Dam Safety and the NRCS TR-60 requirements. Conducted HEC-1, SITES, and DAMBRK simulations which identified that the embankment was likely to breach during the design storms. Directed Golder personnel throughout the project and provided expert advice to facilitate project tasks. Evaluated remedial options to bring the NRCS structure into compliance with the NRCS and State of Georgia design criteria. Directed geotechnical investigation and analysis for evaluation of the dam stability. Design engineer for the rehabilitation design which includes a hybrid concrete and RCC spillway to route the ½ PMP design storm through the watershed.
06/17 – 08/19	**Lower Slate Lake Tailings Dam, Kensington Mine, AK.** *Couer Alaska.* Design reviewer for a downstream tailings dam raise that included a concrete chute spillway on the right abutment. The chute spillway is a combined mass roller compacted concrete base with reinforced concrete training walls.
01/03 – 01/09	**Gwinnett County NRCS Mulberry Creek Dam No. 7, GA.** *Gwinnett County Department of Water Resources.* Evaluation of one NRCS structure for compliance with the Georgia Rules for Dam Safety and the NRCS TR-60 requirements. Performed a geological investigation of the earthen dam and auxiliary spillway to assess dam stability and quantify auxiliary spillway erodibility indices. Conducted HEC-HMS, SITES, and DAMBRK simulations which identified that the embankment was likely to breach during the design storms. Evaluated remedial options to bring the NRCS structure into compliance with the NRCS and State of Georgia design criteria. Assessed seepage issues at the structure and designed the rehabilitation work to modify the existing earthen auxiliary spillway to route the ½ PMP design storm through the watershed and rehabilitate the dam to control seepage.

05/08 – 06/08	**Taum Sauk Rebuild, MO.** *AmerenUE.* Provided periodic quality control and assurance auditing on behalf of AmerenUE during construction of the largest RCC gravity dam in the United States. Gregg assessed compliance of the works with the Construction Drawings and Specifications, and provided expertise in the area of RCC construction and testing.
01/06 – 01/08	**Gwinnett County NRCS Big Haynes Creek Dam No. 25, GA.** *Gwinnett County Department of Water Resources.* Evaluated the NRCS structure for compliance with the Georgia Rules for Dam Safety and the NRCS TR-60 requirements. Conducted HEC-1, SITES, and DAMBRK simulations which identified that the embankment was likely to breach during the design storms. Directed Golder personnel throughout the project and provided expert advice to facilitate project tasks. Evaluated remedial options to bring the NRCS structure into compliance with the NRCS and State of Georgia design criteria. Directed geotechnical investigation and analysis for evaluation of the dam stability. Design engineer for the rehabilitation work which involved modifying the existing earthen auxiliary spillway to route the ½ PMP design storm through the watershed.

Michael Baker Projects

Project Name	Conceptual Design								Environmental				Schedule / Budget	Permits	Additional Services						Software				
	Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data	H&H Analysis	Derive the Probable Maximum Flood (PMF)	Perform Probable Failure Mode (PFM) Determinations	Develop alternatives to mitigate flood risk in the surcharge area above the dam without increasing flood risk downstream of the dam	Determine a preferred alternative	Final Alternative Report: indexed, neatly arranged, bound copy and an electronic copy of all computations used in development of the H&H and SQRA analysis	Schedule, prepare for and present the proposed alternative at conferences/meetings with affected public officials	Determine the level of environmental evaluation of the proposed alternative in accordance such as a Categorical Exclusion, EA or an EIS	Required permits necessary for project execution	Major design features	Environmental mitigation measures necessary	Services necessary to develop a schedule of implementation and estimate costs for design, utility relocations, construction and any environmental mitigation costs	Services necessary to determine permits required for project implementation	Topographic Survey	Utility Relocation	Preliminary Plans	Final Plans	Construction Proposal Services	Construction Support	Shop Drawings	HEC – HMS	HEC – RAS	HEC – FIA	HEC – FDA
DCNR Dam Safety Projects FDC-500-801MB	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		
Rehabilitation of Ten Dams	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Evaluation and Rehabilitation of Multiple Dams	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
High Hazard Risk Screening	X			X																					
Wheeling Creek Site 25 Dam Rehabilitation	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		
Chapman Dam Rehabilitation	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		
Hinkley Lake Dam Modifications	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Taum Sauk Part 12 Inspection and PFMA	X			X																					
MAAPNext Watershed Floodplain Modeling and Mapping	X	X				X	X	X														X	X		
LWI H&H Modeling Contract	X	X				X	X	X			X	X	X		X							X	X	X	X

Prime consultant name: **Michael Baker International, Inc.**

17. FIRM EXPERIENCE

Michael Baker offers a unique blend of national dam rehabilitation and H&H analysis projects combined with vast Louisiana-based experience. We are industry-leading experts in precisely this type of dam contract, with Michael Baker being the fifth largest design firm in dams and reservoirs in the United States. This level of national experience coupled with Michael Baker's 15-year history of successfully delivering DOTD projects, along with our on-going LWI Regional 6 H&H mapping and analysis work, makes Michael Baker the ideal consulting team to deliver unparalleled services to DOTD.

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Survey; Geotechnical; Other**
Project name	**DCNR Dam Safety Projects FDC-500-801MB**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	PA Department of Conservation and Natural Resources
Project location	Various Locations, Pennsylvania	Owner's Project Manager	Edward Raptosh, PE
Owner's address, phone, email	PO Box 8451, Harrisburg PA 17105 (717) 783-3329, eraptosh@pa.gov		
Services commenced by this firm (mm/yy)	09/15	Total consultant contract cost ($1,000's)	$750
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	$650

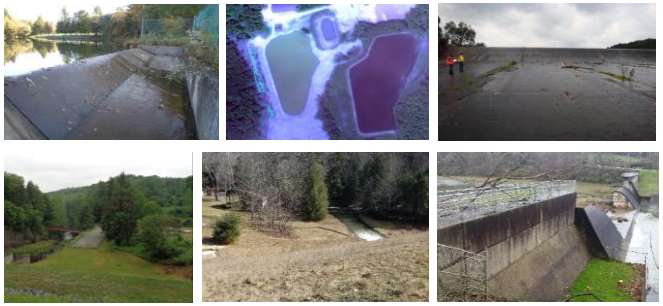
Michael Baker currently holds a five-year open-end contract to provide engineering services to assist the Pennsylvania Department of Conservation and Natural Resources (DCNR) with implementing their dam safety program. Under this contract, Michael Baker's services included dam inspection and assessment, hydrology and hydraulic evaluations, geotechnical investigations, structural assessments, dam break modeling, geotechnical investigations, foundation mapping, alternatives analyses, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, and construction administration and construction inspection. Many of the dams are high hazard structures.

PROJECT RELEVANCE

- High Hazard Dam Rehabilitations
- Geotechnical Investigation
- Survey and Mapping
- Hydrologic and Hydraulic Analysis

Projects under this contract include: Little Buffalo Dam Inspection, Pymatuning Dam, Raccoon Creek Dam, Laurel Mountain State Park Water Supply Dams, Lackawanna State Park - Trostle Pond Dam, and Laurel Hill State Park - Penn Scenic View Lake Dam. Ryerson Dam Removal is currently being designed under this contract. For these projects Michael Baker held joint review meetings with DCNR's dam safety, parks and recreation staff, and engineering divisions, which achieved buy-in during the design process and expedited the review and approval process. Additionally, Michael Baker worked closely with regulatory review agencies, including the Pennsylvania Department of Environmental Protection, Division of Dam Safety, to coordinate and expedite permit approval process. Details are provided for selected projects.

- Raccoon Creek Dam
- Pymatuning Dam
- Laurel Mountain State Park Water Supply Dam
- Trostle Pond Dam
- Little Buffalo State Park Seepage Investigation
- Laurel Hill State Park – Penn Scenic View Lake Dam
- Sinnemahoning State Park – George B. Stevenson Dam
- Ryerson Dam Removal



Challenge: One challenge was to develop Dam Repair Options with a limited budget. **Solution:** Michael Baker evaluated dam conditions and deficiencies, evaluated options for repairs, and prioritized improvements within the available construction budget to bring dams into compliance with dam safety criteria.

Team Members: **Jared Deible, Steve Kramer, Don Green, Gang Zuo, John Lasko, Don Gregor, Joe Kudritz, Brian Afek, Ed Kaminski**

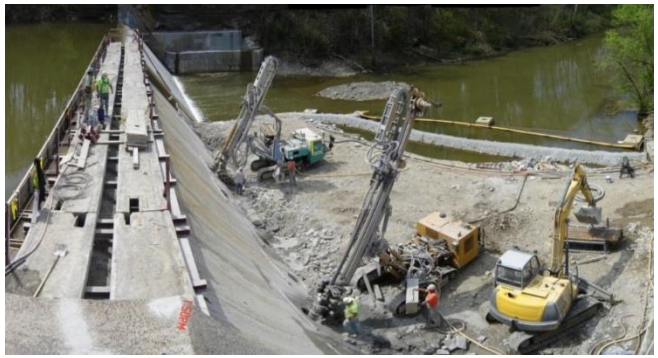
Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Geotechnical; Survey; Environmental; Other**
Project name	**Rehabilitation of Ten Dams**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Pennsylvania Department of General Services (DGS)/PA Fish and Boat Commission
Project location	Various Locations, Pennsylvania	Owner's Project Manager	Bryan Anthony
Owner's address, phone, email	1800 Herr Street, Harrisburg PA 17103, (717) 787-5616, branthony@pa.gov		
Services commenced by this firm (mm/yy)	01/09	Total consultant contract cost ($1,000's)	~$4,500
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	~$3,500

Michael Baker is responsible for bringing ten dams owned by the Pennsylvania Fish and Boat Commission (PFBC) into compliance with the current PADEP regulations. These projects included an initial inspection of the dams in order to assess the conditions of the embankments, spillways, and outlet works. Hydrology and hydraulic evaluations, geotechnical investigations, and structural assessments were conducted for each of the dams. The dams were divided into two groups, the first group of five dams completed from 2009 through 2021. Of the five dams, four were earthen dams and required overtopping protection to pass flood events, while the fifth dam was concrete and required post-tensioned rock anchors to stabilize the dam. Overtopping protection was provided through the use of Articulated Concrete Blocks (ACB) or Roller Compacted Concrete (RCC) depending on the depth of overtopping. Three of the earthen dams required the replacement of the spillways based on the results of the structural assessment and geotechnical investigations. Improvements to the seepage collection systems and replacement of outlet works, including sliplining, installation of new gates and stoplogs, and concrete repairs and replacements were incorporated for all of the dams. Michael Baker held joint review meetings with PADEP, PADGS, and the owner PFBC which achieved buy-in during the design process and expedited the review and approval process. Michael Baker developed construction documents for each of the dams, two of which are completed, and three others are currently in construction. Michael Baker provided construction oversight for each project to ensure that the construction is conducted in accordance with the drawings and specifications.

The second group of five dams is being completed from 2021 through 2025. The deficiencies for these dams include inadequate spillway capacity, seepage and inadequate drainage systems, concrete deterioration, and outlet works deficiencies.

PROJECT RELEVANCE

- High Hazard Dam Rehabilitations
- Geotechnical Investigation
- Survey and Mapping
- Hydrologic and Hydraulic Analysis
- Spillway Capacity Improvements
- Embankment Improvements
- Concrete Repairs and Replacement
- Permitting
- Construction Administration



Challenge: One challenge was inadequate spillway capacity at multiple projects with limited construction budget. **Solution:** Michael Baker developed or is developing site specific solutions to address spillway capacity while maintaining pool levels, downstream impacts, and the construction budget. The solutions include labyrinth spillways, overtopping protection, embankment raises, and a combination of solutions.

Team Members: Jared Deible, Steve Kramer, Don Green, Gang Zuo, John Lasko, Don Gregor, Joe Kudritz, Brian Afek, Ed Kaminski

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Geotechnical; Survey;**
Project name	**Evaluation and Rehabilitation of Multiple Dams**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Ohio Department of Natural Resources
Project location	Statewide, Ohio	Owner's Project Manager	James Hilovsky
Owner's address, phone, email	2045 Morse Road, Building E3, Columbus OH 43229 (614) 265-6967, james.hilovsky@dnr.state.oh.us		
Services commenced by this firm (mm/yy)	01/16	Total consultant contract cost ($1,000's)	~$13,000
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	~$11,000

Michael Baker has provided or is providing engineering services for 15 dams owned by ODNR that have been or are currently being rehabilitated to bring them into compliance with current state safety regulations; Roosevelt Lake, Pike Lake, Pond Lick, Lake Alma, Lake Loramie, Mount Gilead, Blue Rock, Buckeye Lake, Stewart Lake, Knox Lake, Muskingum Lock and Dam 7, Clark Lake, Cowan Lake, Spencer Lake, Lake Katharine, and the Ohio & Erie/Miami & Erie Canal Systems. Michael Baker's services include dam inspections and assessments, hydrology and hydraulic evaluations, geotechnical investigations, instrumentation installation, structural assessments, dam break modeling, foundation mapping, alternatives analysis, structural design, rehabilitation design, permitting, emergency action plans, bidding-phase support, construction administration, and construction inspection. Construction has been completed at Roosevelt Lake, Pike Lake, Pond Lick Lake, Lake Alma, Lake Loramie, Mount Gilead, Buckeye Lake, Blue Rock, Stewart Lake, and Knox Lake. Muskingum Lock and Dam 7 is in the design-build stage, and Clark, Cowan, Spencer, Lake Katharine, and the Canal System are in the evaluation or design stage. Modifications have included:

- Addressing stability issues for concrete structures through post-tensioned anchors or dowels, concrete overlays, and complete replacements
- Embankment modifications including stability berms, filters and drains, and complete embankment reconstruction
- Addressing inadequate spillway capacity with spillway expansions, construction of new labyrinth spillways, and installation of RCC overtopping protection
- Dam removal and stream channel restoration
- Outlet works modifications including sliplining, installation of new gates and stoplogs, and concrete repairs and replacement

These projects have been completed using design-bid-build contracting, Construction Manager at Risk (CMAR) contracting, and design-build contracting. For all projects, Michael Baker provided construction management and oversight to ensure that construction was performed in accordance with the drawings and specifications. This included site inspections, progress meetings, and daily inspections during the construction of key components.

Challenge: One challenge was construction within active parks and recreation areas. **Solution:** Michael Baker prepared designs that considered the settings within a natural park setting including maintaining normal pool during construction, incorporating recreational features and improvements, and aesthetic improvements.

Team Members: **Jared Deible, Steve Kramer, Don Green, Gang Zuo, John Lasko, Don Gregor, Joe Kudritz, Brian Afek, Ed Kaminski**

PROJECT RELEVANCE

- High Hazard Dam Rehabilitations
- Geotechnical Investigation
- Survey and Mapping
- Hydrologic and Hydraulic Analysis
- Spillway Capacity Improvements
- Embankment Improvements
- Concrete Repairs and Replacement
- Permitting
- Construction Administration

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Other**
Project name	**High Hazard Risk Screening**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	New Jersey Department of Environmental Protection, Bureau of Dam Safety
Project location	Statewide, New Jersey	Owner's Project Manager	Sarah Hatala
Owner's address, phone, email	44 S Clinton Avenue, 3rd Floor, Trenton NF 08625, (609) 984-0859, Sarah.hatala@dep.nj.gov		
Services commenced by this firm (mm/yy)	02/21	Total consultant contract cost ($1,000's)	$261
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	$261

Michael Baker is providing engineering services for the assessment and risk screening for 37 high hazard dams for the New Jersey Office of Emergency Management and New Jersey Department of Environmental Protection (NJDEP). This enhanced risk assessment will allow NJDEP to comply with Federal Emergency Management Agency (FEMA) requirements as part of the High Hazard Potential Dams (HHPD) Grant Program.

PROJECT RELEVANCE

- Site investigation and assessment
- Potential Failure Modes Analysis (PFMA)
- Qualitative Risk Assessment

As part of this project, Michael Baker is performing the following tasks:

- Information Collection and Data Review: Michael Baker is collecting information from NJDEP files on dam condition, past assessments, design and as-built information, recent modifications, photos, deficiencies, and other relevant information.
- Potential Failure Modes Analysis: Based on information available, Michael Baker engineers are performing a Potential Failure Modes Analysis (PFMA) for each of the structures to better understand the structure deficiencies, critical failure modes, events that could lead to a failure, risk reduction measures, and impacts of failure.
- Impacts Assessment: Michael Baker is using existing inundation mapping and flood analysis to assess and catalog the potential downstream impacts for each failure mode. Items being categorized include population at risk, economic impacts to structures, and roadways, and environmental and other impacts.
- Risk Screening and Matrix: A team of Michael Baker staff developed a qualitative risk screening procedure for the dams considering the information available on the dam construction and condition, potential failure modes, and downstream impacts. The risk screening is based on FEMA's dam safety guidance and has been customized for the portfolio of dams.

Challenge: One challenge was how to prioritize repairs for a large portfolio of dams. **Solution:** Development of a matrix that provides an overall inventory of the projects considered and a summary of the information available at each site, providing a simple resource to quickly understand the portfolio of projects. The innovative approach for the semi-quantitative risk assessment evaluates and ranks projects based on the information available, allowing the client to understand the critical potential failure modes at each site and the critical sites and projects that could most effectively reduce overall risk.

Team Members: Jared Deible, Joe Kudritz

Screening Level Risk Rating	II - High Urgency
Screening Level Risk Rating Explanation	Steenykill Lake Dam was rated a Category II – High Urgency primarily because of two reasons – (1) the heavy vegetation in the spillway appears to significantly reduce spillway capacity and the dam already has inadequate spillway capacity during the PMF, and (2) heavy vegetation on the embankment makes inspection and monitoring of the embankment difficult, especially monitoring of previously identified depression at the crest and steep embankment slopes. This project better fits the Category II Screening Level Risk Rating (SLRR) because during a flood event spillway obstruction and potential dam overtopping is likely, meaning "risk is high with high confidence"
Comments and Summary	2018 Inspection notes additional downstream development is likely since last EAP update. 2005 Dam breach analysis indicates dam overtops by 0.7 feet during PMF (after spillway modifications). Heavy vegetation in spillway reduces capacity significantly, and capacity is already inadequate. Heavy vegetation on dam makes inspection difficult and origin/cause of depression on crest is unknown.
Recommended Remediation	Remove vegetation from spillway and dam, backfill previously observed depression, and evaluate if spillway capacity improvements are required.

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Survey; Other**
Project name	**Wheeling Creek Site 25 Dam Rehabilitation**	Firm responsibility (prime or sub?)	Joint-Venture
Project number	N/A	Owner's name	Natural Resources Conservation Service (NRCS)
Project location	Marshall County, West Virginia	Owner's Project Manager	Andy Deichert
Owner's address, phone, email	1550 Earl Core Road, Suite 200, Morgantown, WV 26505, (304) 284 7563, andy.deichert@wv.usda.gov		
Services commenced by this firm (mm/yy)	10/18	Total consultant contract cost ($1,000's)	$1,300
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	~$850

Michael Baker, as part of the North Wind Resources Partnership JV, is providing engineering services for rehabilitation of the Wheeling Creek Site 25 Dam. There has been significant development downstream of the site since original construction, so the dam has been reclassified as a High Hazard Potential structure. The structure will undergo rehabilitation to meet current West Virginia Department of Environmental Protection (WVDEP) Dam Safety criteria and Natural Resources Conservation Service (NRCS) design criteria and standards. Wheeling Creek Site 25 is an existing rolled earth fill embankment dam located on Wolf Run in Marshall County, West Virginia. The current structure was constructed in 1977 with a maximum height of 85 feet.

PROJECT RELEVANCE

- High Hazard Dam Rehabilitation
- Geotechnical Investigation
- Survey and Mapping
- Hydrologic and Hydraulic Analysis
- Spillway Capacity Improvements
- Embankment Improvements
- Construction Administration

Project Improvements. Rehabilitation will include widening the auxiliary spillway by approximately 100 feet on the left side, armoring the widened auxiliary spillway with Roller Compacted Concrete (RCC), constructing a filter and drain system and berm at the toe of the existing dam using material from the auxiliary spillway, and reconstructing the principal spillway riser and impact basin. The modifications will allow the project to safely pass the Probable Maximum Flood (PMF) and meet all current NRCS and WV design criteria.

Hydrologic and Hydraulic Analysis. Michael Baker is conducting a hydrologic and hydraulic analysis of the existing primary and auxiliary spillways and designing improvements to pass floods up to and including the PMF event. As part of the analysis, Michael Baker is using the SITES program, developed by NRCS.

Structural Investigation and Design. Michael Baker and our teaming partner are performing structural design of a new intake structure and impact basin in the outlet structure. The existing reinforced concrete riser structure will be reconfigured and reconstructed to prevent potential debris plugging and address structural deterioration that has been observed. The impact basin is being replaced to address deterioration that has been observed and update it to current NRCS standards.

Geotechnical Investigation and Design. Michael Baker is performing a geotechnical investigation that focuses on providing additional data along the existing and expanded auxiliary spillway, near the riser structure, near the proposed impact basin, and at the dam toe. The subsurface investigation results, including laboratory testing, are being used in detailed design of the remedial measures. Stability and seepage analyses are being performed on the existing embankment, including detailed design of a new stability berm and embankment drain. A settlement and stability analysis will be performed for the new RCC and training walls within the auxiliary spillway. A new toe drain is anticipated at the toe of the dam to replace the existing drains and a new graded filter and collector drainpipes will be installed. Seepage will be monitored using weirs.

Construction Documents and Construction Administration. Michael Baker is preparing construction documents, including plans and specifications, for the dam rehabilitation. All design and analysis is performed in accordance with NRCS guidance and requirements. Michael Baker is also preparing RCC mix designs for the auxiliary spillway lining. Michael Baker will also provide construction management and oversight to ensure that construction is performed in accordance with the drawings and specifications. This will include site inspections, progress meetings, and daily inspections during the construction of key components.

Challenge: One challenge was how to address integrity of and capacity of spillway without changing pool levels during flooding. **Solution:** A new spillway is being constructed with the same crest elevation, but an increased crest length and RCC armoring to pass the PMF event.

Team Members: **Jared Deible, Steve Kramer, Don Green, Gang Zuo, John Lasko, Don Gregor, Joe Kudritz, Brian Afek, Ed Kaminski**

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Geotechnical; Environmental; Other**
Project name	**Chapman Dam Rehabilitation**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Pennsylvania Department of General Services (DGS)
Project location	Warren County, Pennsylvania	Owner's Project Manager	Bryan Anthony
Owner's address, phone, email	333 Market St #2, Harrisburg, PA 17101, (717) 787-5616, branthony@pa.gov		
Services commenced by this firm (mm/yy)	01/14	Total consultant contract cost ($1,000's)	$1200
Services completed by this firm (mm/yy)	12/19	Cost of consultant services provided by this firm ($1,000's)	$1050

Michael Baker provided engineering services for the rehabilitation of Chapman Dam to ensure compliance with PA Dam Safety Regulations. Michael Baker's services included site and geotechnical investigation, hydrologic and hydraulic analysis, permitting, dam inspection, rehabilitation design, and construction management and inspection services. Chapman Dam consists of a 515-foot-long earthen embankment with a maximum height of 24 feet.

PROJECT RELEVANCE

- High Hazard Dam Rehabilitation
- Geotechnical Investigation
- Survey and Mapping
- Hydrologic and Hydraulic Analysis
- Spillway Capacity Improvements
- Embankment Improvements
- Concrete Repairs and Replacement
- Permitting
- Construction Administration

Project Improvements. Improvements include: select demolition, spillway slab replacement, spall repair, control tower modifications and lake drain extensions, outlet conduit sliplining, roller compacted concrete (RCC) overtopping protection, grout curtain installation, and lake dredging. The rehabilitations brought the project into compliance with current regulations.

H&H Analysis. Michael Baker conducted a H&H analysis to determine the peak discharge and pool elevation for the Probable Maximum Flood (PMF) event. The analysis indicated the spillway had inadequate capacity to convey the PMF event without overtopping the embankment. RCC overtopping protection and runout apron were designed based on overtopping depths. Hydraulic calculations were performed to verify the lake drain has adequate capacity to dewater the lake.

Structural Investigation and Design. Structural assessments of the existing spillway revealed that the primary spillway is in adequate condition and requires minor spall and crack repairs. Several spillway slabs need to be replaced since drainage layers beneath the spillway were determined to be in poor condition. Inspections of the control tower revealed severe deterioration above the water surface elevation, which was reconstructed to extend the life of the structure. Investigations also revealed that the current outlet works are inoperable, so replacement gates were installed. The design of the control tower included the sliplining of the existing lake drain in lieu of replacement, which would have required extensive excavation within the embankment.

Geotechnical Investigation. Michael Baker prepared a subsurface exploration plan to assess the embankment and the existing drainage layers under the spillway. Geotechnical investigations revealed seepage concerns within the embankment. Michael Baker designed a grout curtain within the embankment to address seepage. Drainage layers are provided below the RCC layers to collect additional seepage and prevent the build-up of uplift pressures or uncontrolled seepage.

Permitting and Project Coordination. Michael Baker's engineers and environmental specialists conducted the required wetland investigation and prepared all the environmental permits required to complete the project. Michael Baker employed a proactive approach with all regulatory agencies by holding joint meetings with the owner to discuss all viable alternatives. The joint meetings allowed all parties to discuss concerns with the regulatory agency and understand any cost implications. This approach has expedited the review process and has aided the stakeholders in achieving consensus on decisions.

Challenge: One challenge was how to address deteriorated concrete within existing spillway and inadequate spillway capacity. **Solution:** Michael Baker preserved part of the existing spillway to **save on construction costs and reduce the construction timeframe**. Overtopping protection was also added to increase spillway capacity.

Team Members: **Jared Deible, Steve Kramer, Don Green, Gang Zuo, John Lasko, Don Gregor, Joe Kudritz, Brian Afek, Ed Kaminski**

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Survey; Environmental; Other**
Project name	**Hinkley Lake Dam Modifications**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Cleveland Metroparks (CMP)
Project location	Medina County, Ohio	Owner's Project Manager	Sean McDermott
Owner's address, phone, email	4101 Fulton Parkway, Cleveland Ohio 44144, (216) 635-3258, sem1@clevelandmetroparks.com		
Services commenced by this firm (mm/yy)	08/17	Total consultant contract cost ($1,000's)	$600
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	$500

Michael Baker is providing engineering services to design modifications for Hinckley Lake Dam to ensure compliance with ODNR Dam Safety Regulations. The dam's current configuration didn't have adequate capacity to convey the Probable Maximum Flood (PMF) design event over the spillway without overtopping the dam. The dam consists of a 150-foot long straight-drop concrete spillway that is flanked on either side by earthen embankments that total approximately 730 feet. The concrete spillway and training exhibit signs of concrete deterioration and spalling.

PROJECT RELEVANCE

- High Hazard Dam Rehabilitation
- Geotechnical Investigation
- Survey and Mapping
- Hydrologic and Hydraulic Analysis
- Spillway Capacity Improvements
- Embankment Improvements
- Concrete Repairs and Replacement
- Permitting
- Construction Administration

Preliminary Design Phase. Michael Baker developed design alternatives to address the deficiencies including either installing roller compacted overtopping protection or raising the embankment to increase the storage capacity of the lake. To meet stability requirements and address the structural deficiencies of the spillway, Michael Baker considered a replacement spillway and a rehabilitated spillway that addressed stability concerns using additional concrete mass or post-tensioned anchors.

Project Improvements. The improvements to the dam include modifications to the existing spillway, embankment, and lake drain. The spillway modifications will include the addition of concrete mass to meet current dam safety stability requirements. The upper portion of the spillway weir will be re-constructed and will match the appearance and hydraulic characteristics of the existing spillway. The embankment will be raised by 4 feet to the contain the PMF design event.

H&H Analysis. Detailed H&H analyses were performed to evaluate Hinckley Lake. The H&H analysis evaluated the existing and proposed dam configuration to determine the embankment height required to contain the PMF design event. The proposed spillway was evaluated to ensure that post-construction flows do not exceed pre-construction flows up to and including the 100-year storm event. A draft Emergency Action Plan (EAP) will be developed for the final design dam configuration.

Geotechnical and Structural Investigation and Analysis. Subsurface drilling and sampling were performed along the embankment and immediately downstream of the stilling basin. The results of the drilling are being used in the stability and seepage analyses for the embankment and the spillway. Based on the analyses, the spillway, in its current configuration, does not meet current stability safety factors. Michael Baker performed a non-destructive, structural assessment of the existing spillway and training walls. The results of the assessment revealed extensive deterioration of the existing concrete spillway and walls. Michael Baker is performing structural calculations to support a reinforced concrete spillway overlay, new training wall sections, and training wall facing.

Construction Documents and Construction Administration. Michael Baker will be responsible to prepare final construction documents that include plans and specifications for bidding. Michael Baker will also provide construction management oversight and will perform daily inspections, attend monthly progress meetings, and critical pre-installation meetings to ensure the dam is rehabilitated in accordance with the drawings and specifications.

Challenge: One challenge was how to address a historic spillway structure with stability deficiencies. **Solution:** Michael Baker developed an innovative solution to add mass to the existing spillway to improve stability, reduce costs, and **preserve the appearance and recreational functions of the existing spillway.**

Team Members: **Jared Deible, Steve Kramer, Don Green, Gang Zuo, John Lasko, Don Gregor, Joe Kudritz, Brian Afek, Ed Kaminski**

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Data Collection; Other**
Project name	**Taum Sauk Part 12 Inspection and PFMA Update**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Ameren Missouri
Project location	Ameren – Ironton, Missouri	Owner's Project Manager	Marc Lueckenhoff
Owner's address, phone, email	11149 Lindbergh Business Court, St. Louis, Missouri 63123, (314) 957-3391, mlueckenhoff2@ameren.com		
Services commenced by this firm (mm/yy)	02/21	Total consultant contract cost ($1,000's)	$40
Services completed by this firm (mm/yy)	11/21	Cost of consultant services provided by this firm ($1,000's)	$40

Michael Baker is performed the Eleventh Part 12D Inspection for the Taum Sauk Hydroelectric Project. The Project is located in Reynolds County, Missouri, on the East Fork of the Black River, approximately 90 miles southwest of St. Louis, Missouri. The Project includes an Upper Reservoir, powerhouse with reversible pump-turbines, and a Lower Reservoir. A water conveyance system including a vertical shaft, unlined tunnel, lined tunnel, and penstock connect the powerhouse to the Upper Reservoir. The facility was originally constructed in 1963 and the Upper Reservoir was completely rebuilt after a breach in 2005. The Project is a pumped storage plant used to supplement Ameren's generation facilities.

PROJECT RELEVANCE

- Dam Inspection and Assessment
- PFMA update

The Independent Consultant Safety (Part 12D) Inspection is a comprehensive evaluation and field inspection of the licensed portion of the project. This Project included a review of background data, a detailed visual inspection of the facility, a Potential Failure Modes Analysis (PFMA) review session, and preparation of the associated reports.

Michael Baker prepared a revised PFMA Report detailing updates to the Potential Failure Modes (PFMs) for the Project. Michael Baker also prepared the Part 12D Inspection Report, which includes a summary of the inspection, an assessment of instrumentation and monitoring data, an evaluation of PFMs, an evaluation of Operation and Maintenance procedures, and an assessment of supporting analyses and documentation for the Project.

Challenge: One challenge was to review and update potential failure modes for the project. **Solution:** Michael Baker staff held a PFMA review session with FERC and Ameren staff to update PFMs for the project and prepared an updated PFMA report documenting the results of the review.

Team Members: Jared Deible, Brian Afek

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Other; Data Collection; Survey**
Project name	**MAAPNext Watershed Floodplain Modeling and Mapping (Brays Bayou, Goose Creek, and Jackson Bayou Watersheds)**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Harris County Flood Control District
Project location	Harris County, Texas	Owner's Project Manager	Brian Edmondson, PE, CFM (MAAPNext PM)
Owner's address, phone, email	9900 Northwest Freeway, Houston, TX 77092, (346) 286-4000. Brian.Edmondson@hcfcd. hctx.net		
Services commenced by this firm (mm/yy)	04/19	Total consultant contract cost ($1,000's)	$1,939
Services completed by this firm (mm/yy)	12/21	Cost of consultant services provided by this firm ($1,000's)	$1,939

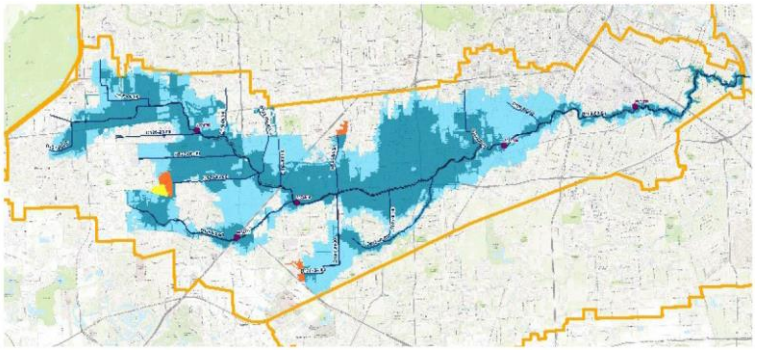
Michael Baker provided professional engineering services for a FEMA and HCFCD funded flood risk analysis and mapping project to update flood hazard data for three watersheds in Harris County- Brays Bayou, Goose Creek, and Jackson Bayou.

This project consists of building detailed HEC-HMS and 1D-2D unsteady HECRAS models for 108 stream miles across the three watersheds to aid the understanding and regulation of flood risk. Tasks include project management, floodplain mapping studies, field surveys, H&H data development, flood hazard data development, and floodplain mapping and flood risk products development. Michael Baker is completing all work in compliance with HCFCD and FEMA guidance, best practices, and standards. Michael Baker performed hydrologic analysis and created HEC-HMS models for each watershed. Activities included watershed and sub-watershed boundary verification and updates, parameter calculation for losses, and hydrograph development using Basin Development Factor (BDF) method and incorporation of NOAA Atlas 14 rainfall data to support the level of detail required for the project.

PROJECT RELEVANCE

- Topographic field survey of open channel reaches and existing culvert/bridge crossings
- New hydrologic model using NOAA Atlas 14 precipitation estimates
- New unsteady 1D/2D hydraulic model of study streams
- Public outreach to gain input on known flood risks throughout the HUC-10

For each of the three watersheds studied, a watershed wide **1D-2D unsteady HEC-RAS** model was created, which includes the main stem and the tributary streams. Storage Area / 2D connections were used at the junctions to provide hydrodynamic continuity. The channel bathymetry cross sections and hydraulic structures were imported from effective hydraulic models and adjusted for subsidence and datum changes. Channel cross sections were added where needed. Channel cross sections along stream reaches were modeled in 1D, incorporating survey and updated structures. Overbank areas were modeled using 2D meshes and incorporating breaklines using 2018 LiDAR terrain data. The 1D sections were connected to the 2D meshes using lateral weirs. The hydraulic models were calibrated using NexRAD precipitation data, gauge data, and high-water mark data. Where available, additional data, including flood loss data, aerial imagery, and social media posts (such as drone footage and photos) were used to validate **model calibration**.



The results of the hydraulic modeling analysis were used to develop FEMA-compliant floodplain and floodway boundaries. Combined probability analysis was performed to account for coastal storm surge impacts on the riverine floodplain. Our team developed flood risk products from the flood study data, including water surface elevation grids, depth grids, and Changes Since Last FIRM maps. Extensive coordination with study partners and stakeholders was accomplished through project meetings, open houses, written and verbal correspondence, and status reports.

Challenge: One challenge was that traditional flood hazard analysis focuses on **riverine (fluvial)** flood risk and does not consider risks associated with **pluvial flooding** which identifies chokepoints in overland flow and storm sewer systems, such that stormwater runoff is unable to reach the bayous and creeks. **Solution:** Michael Baker performed a **rain-on-grid analysis** to **identify flood-prone areas** not captured by the riverine (fluvial) floodplain modeling. This data was used, along with flood loss data, to determine where additional H&H analysis will be needed and will result in additional flood hazard information.

Team Members: Mohamed Bagha | Mujahid Chandoo | Manoj KC | Sahas Shrestha

Firm name	**Michael Baker**	Past Performance Evaluation Discipline(s)*	**Other; Data Collection; Survey**
Project name	**Louisiana Watershed Initiative H&H Modeling Contract – Region 6**	Firm responsibility (prime or sub?)	Prime
Project number	4400017092	Owner's name	DOTD
Project location	Various Counties, Louisiana	Owner's Project Manager	Jie Gu
Owner's address, phone, email	East Wing 5th Floor, N-526B, Baton Rouge, Louisiana 70804-9245, (225) 379-1483, Jie.Gu2@la.gov		
Services commenced by this firm (mm/yy)	11/20	Total consultant contract cost ($1,000's)	$3,557
Services completed by this firm (mm/yy)	Est. 05/23	Cost of consultant services provided by this firm ($1,000's)	$2,001

Michael Baker is providing engineering and modeling services for the Louisiana Watershed Initiative. The project was launched in 2018 and introduced a watershed-based approach to reducing flood risk in Louisiana. It is organized by seven modeling regions, each of which encompasses multiple HUC-8 watersheds.

PROJECT RELEVANCE

- Watershed existing condition evaluation
- LWI Guidelines and Criteria
- Hydrologic and Hydraulic Modeling
- Leading a multiple discipline project team consisting of Michael Baker and local subconsultants

Task Order 1: For the first task-order of the contract, Michael Baker collected existing watershed datasets, models, and studies for 4 HUC-8 watersheds in southeast Louisiana, developed and proposed a detailed modeling design approach with schedules and cost estimates, and prepare a data gap analysis and collection report. Michael Baker developed the methodology for modeling flood risks in the transition zone (where both coastal and riverine flood risk exist.) Michael Baker's collection of watershed datasets, models, and studies included the following deliverables: previous FEMA watershed studies, hydrological and hydraulic (H&H) modeling data, LiDAR and survey data, historical flood information, hydrometeorology and hydrography datasets, highwater marks, land-use and soils information, and water quality information. Michael Baker also developed a HUC-8 modeling design approach for H&H studies in the 4 HUC-8 watersheds based on historical information and prepared a data management plan for organizing and reporting the data it collected.

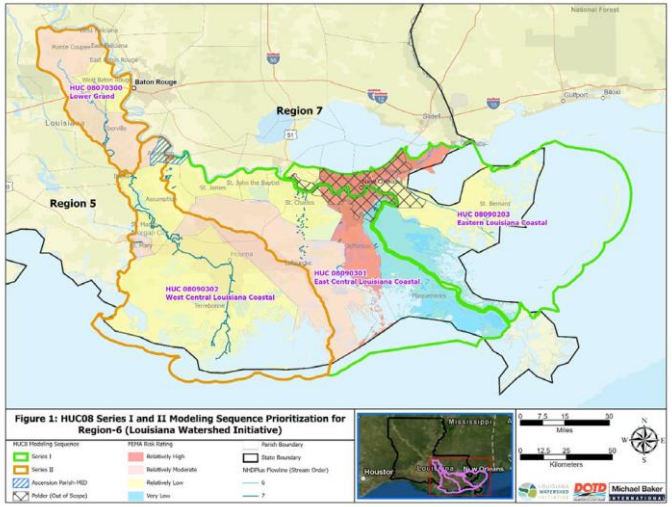


Figure 1: HUC08 Series I and II Modeling Sequence Prioritization for Region-6 (Louisiana Watershed Initiative)

Task Order 2: Michael Baker performed HUC-8 hydrologic and hydraulic modeling for the Eastern Louisiana Coastal and East Central Louisiana Coastal watersheds. For this task, it supplemented the data collection and data gap analysis completed in Task Order 1, provided quality control and assurance, continued stakeholder engagement efforts including holding any necessary public meetings, continue reviewing historic storm events to adjust data collection and analysis, and perform topographic, bathymetric, and channel surveys. The Eastern Louisiana Coastal and East-Central Louisiana Coastal watersheds include transition and coastal zones. Michael Baker developed a tiered modeling design plan for H&H studies for these zones and developed internal and external boundary conditions. The tiered modeling structure recommended detailed studies in areas of higher need (greater losses, unconfined flooding and areas prone to development.) Michael Baker developed rain-on-grid analyses using HEC-RAS 6.0 and calibrated the models using large and recent storm events. Deliverables included a technical report, a quick-training guide to support future modeling, and an update to the data management plan.

Challenge: Region 6 of the Louisiana Watershed Initiative is characterized by widespread swamps, marshlands, and dense natural and man-made river channel networks. The traditional H&H modeling method simulates hydrology and hydraulics separately, with rivers modeled by 1D elements, relying on a modeler's judgment. Overall, the traditional H&H modeling takes more time and resources. **Solution:** During the contract scoping and fee negotiation phase, Michael Baker worked with the client to develop a detailed H&H modeling work plan for Region 6 using cutting-edge 2D H&H modeling. The 2D H&H modeling approach integrates hydrology with hydraulics in one model run to better model a real-world, precipitation-runoff-routing process. **Michael Baker shortened the project schedule by one to two years and saved the client approximately $2 million in consulting fees by adopting this approach.**

Team Members: Yingjian (Jim) Han | Mohamed Bagha | Manoj KC | Sahas Shrestha | Daniel Thornhill | Craig Wenger

Forte & Tablada Projects

Prime consultant name: **Michael Baker International, Inc.**

Firm name	**Forte and Tablada, Inc.**	Past Performance Evaluation Discipline(s)*	**Survey**
Project name	**Almonaster Avenue Lift Bridge**	Firm responsibility (prime or sub?)	Sub
Project number	S.P. No. H.004698	Owner's name	DOTD
Project location	Orleans Parish, LA	Owner's Project Manager	Jan Evans (Sub to Volkert & Associates)
Owner's address, phone, email	7967 Office Park Boulevard, Baton Rouge, LA 70809, 225-218-9440, jevans@volkert.com		
Services commenced by this firm (mm/yy)	02/13	Total consultant contract cost ($1,000's)	$185
Services completed by this firm (mm/yy)	10/13	Cost of consultant services provided by this firm ($1,000's)	$185

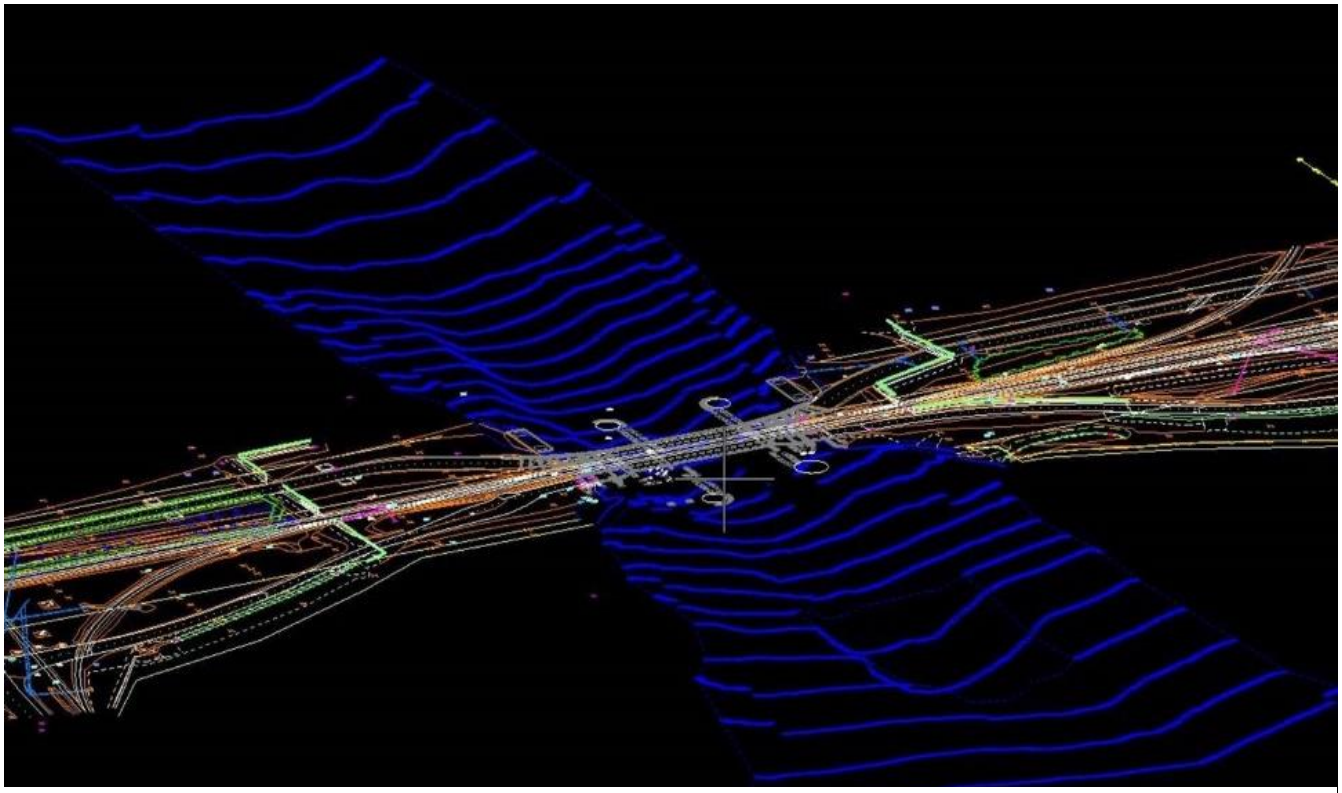
Forte and Tablada, Inc. was responsible for performing complete topographic and property surveys, developing a drainage map, and establishing existing right-of-way for North line of I-10, CSX Railroad property and Almonaster, establishing elevations to develop a Digital Terrain Model with the widths matching the limits of the topographic survey, and providing a drainage map. The entire bridge super and sub structures were scanned to locate every pile. Bridge clearances were found, extracting two-dimensional line work for the superstructure. A horizontal plan of two-dimensional site plan for the bridge and a volume calculation for the counterweight was also created. As there was no access to the adjacent rail property, Forte and Tablada, Inc.'s Advanced Measurements was able to use three- dimensional laser scanning to survey the area without permits or trespassing on railroad right of way. This project demonstrates Forte & Tablada's topographic survey, property survey, ROW maps and tile take off experience for transportation projects.

PROJECT RELEVANCE

- Topographic survey

Challenge: The project schedule didn't allow for enough time to receive the necessary permits to survey within the railroad's right-of-way. **Solution:** The team constructed a taller tripod to scan areas within the Railroad right-of-way eliminating the need for an additional permit.

Team Members: Ross Wilson, PLS



Bathymetric Data Integrated with Topographic Survey

Firm name	**Forte and Tablada, Inc.**		Past Performance Evaluation Discipline(s)*	Survey	
Project name	**Belle Chasse Bridge and Tunnel Replacement**			Firm responsibility (prime or sub?)	Prime
Project number	S.P. No. H.004791.5		Owner's name	DOTD	
Project location	Plaquemines Parish, LA		Owner's Project Manager	Stanley Ard	
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA 70804, 225-379-1292, stanley.ard@la.gov				
Services commenced by this firm (mm/yy)	05/17		Total consultant contract cost ($1,000's)	$401.7	
Services completed by this firm (mm/yy)	10/18		Cost of consultant services provided by this firm ($1,000's)	$249.6	

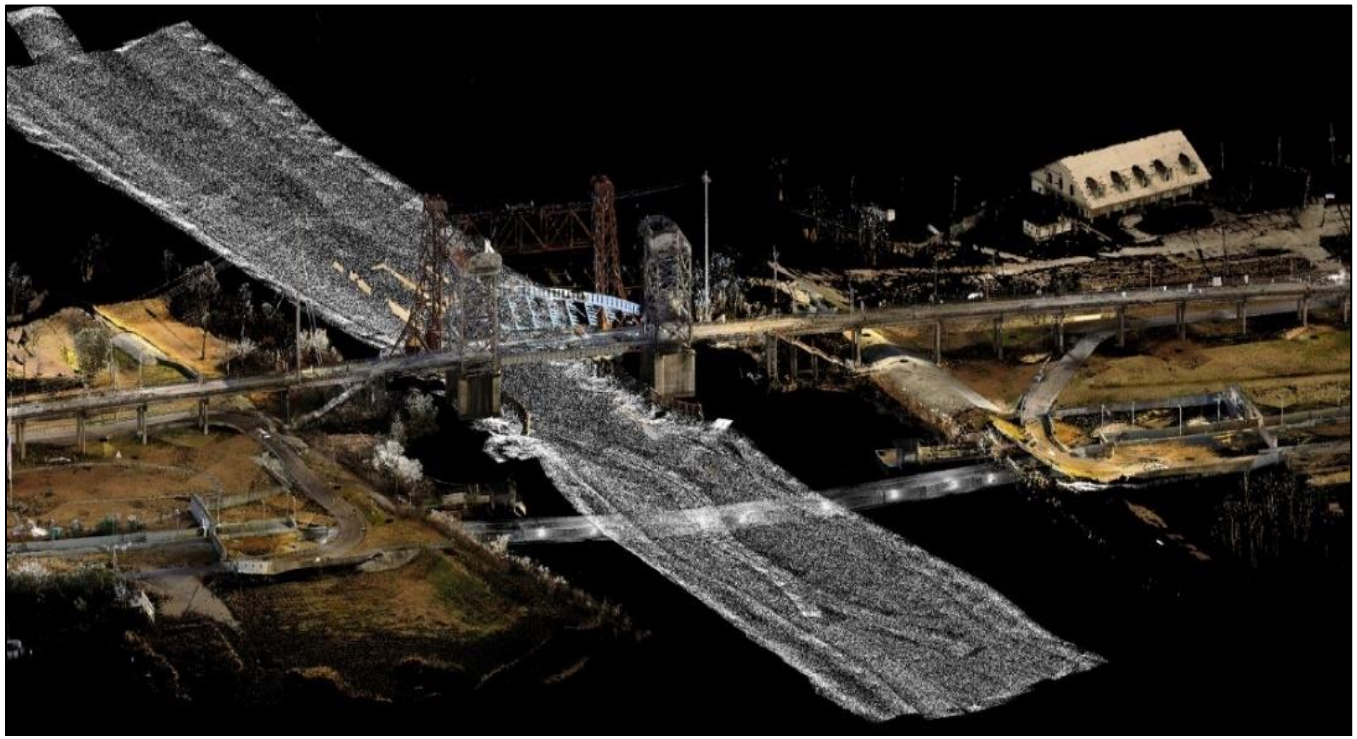
Forte and Tablada, Inc. provided comprehensive topographic survey for the Belle Chase Bridge and Tunnel Replacement project for DOTD. Included in this work was a survey performed utilizing traditional methods, terrestrial laser scanning of roadway surfaces, and multi-beam 3-D hydrographic surveying.

PROJECT RELEVANCE

- Topographic survey

Challenge: The primary challenge for this project was to complete the topographic survey, while not shutting down travel on the bridge nor tunnel. In order to perform a traditional topographic survey, the feature being measured must be in physical reach of the equipment operator. **Solution:** Forte and Tablada was able to overcome this challenge through the use of remote sensing technology. Remote sense was used in the form of LiDAR for the bridge and overpass, and multi-beam sonar for the water bottom and top of tunnel. A robot was fabricated by Forte and Tablada staff to ride the bridge rail with the LiDAR scanner in order to avoid lane closures and improve the safety of equipment operators.

Team Members: Ross Wilson, PLS



Laser Scan and Hydrographic Survey of Belle Chasse Bridge and Tunnel project area

Firm name	**Forte and Tablada, Inc.**		Past Performance Evaluation Discipline(s)*	**Survey**	
Project name	**Amite River Basin Model- Hydrographic Survey**			Firm responsibility (prime or sub?)	Sub
Project number	4400008293		Owner's name	DOTD	
Project location	Livingston Parish, LA		Owner's Project Manager	Edward Knight, PE	
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA 70804, (225) 379-3007, edward.knight@la.gov				
Services commenced by this firm (mm/yy)	06/17		Total consultant contract cost ($1,000's)	$349	
Services completed by this firm (mm/yy)	02/19		Cost of consultant services provided by this firm ($1,000's)	$349	

Forte and Tablada, Inc. worked with DOTD and Dewberry to provide hydrographic surveying of the Amite River and Comite River. Task orders included typical cross-sections of these rivers, as well as detailed 3-D bathymetric data collected with sonar equipment. Forte and Tablada also provided ground control for LIDAR of the Amite River Basin. Notably, Forte and Tablada provided a high-resolution survey of the Amite River Diversion Weir utilizing a variety of techniques including multi-beam sonar and traditional survey methods.

PROJECT RELEVANCE

- Topographic survey

Challenge: The largest challenge for this project was the varying water depths of the Amite and Comite River, which prevented the use of a single type of data collection system. **Solution:** Forte and Tablada was able to overcome this challenge through the multiple types of data collection systems within its inventory. A wide swath multi-beam sonar unit was used to collect data remotely into shallow water areas, single-beam sonar equipment was used in to confirm the results of the multi-beam areas as well as collect bathymetry data in water less than 2 feet deep. LiDAR laser scanners were used on bridge structures to give a seamless representation of the underwater conditions as well as above water conditions for a precise bridge opening area. The image above depicts the seamless merging of these two data sets collected utilizing two different types of data collection systems.

Port Vincent Bridge Scan and Bathymetry Integrated

Team Members: Ross Wilson | Brent Campbell

Firm name	**Forte and Tablada, Inc.**	Past Performance Evaluation Discipline(s)*	**Survey**
Project name	**Amite River Weir Restoration**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Livingston Parish Government
Project location	Livingston Parish, LA	Owner's Project Manager	Mark Harrell
Owner's address, phone, email	20355 Government Blvd. Livingston, LA 70754; 225-686-2266; lohsep1@lpgov.com		
Services commenced by this firm (mm/yy)	08/19	Total consultant contract cost ($1,000's)	$700
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	$700

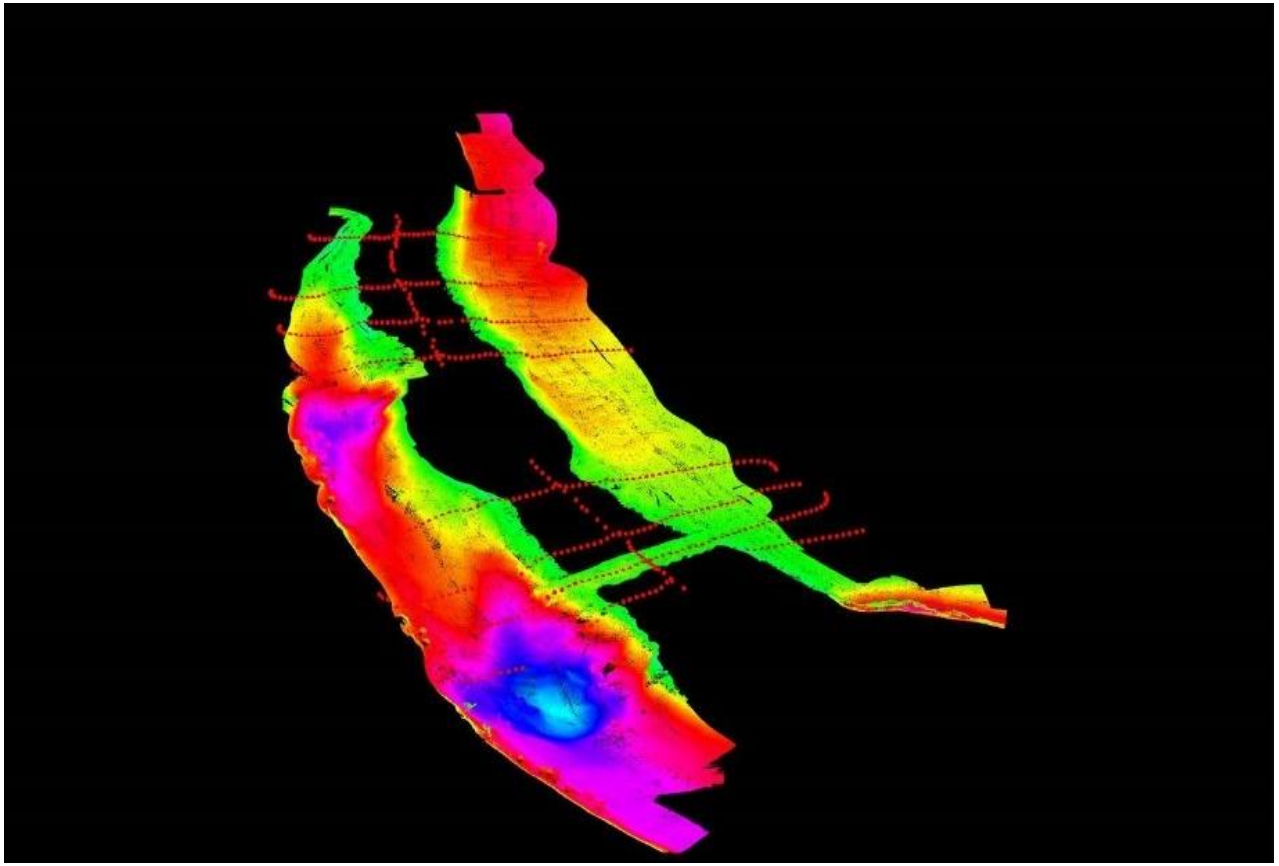
Forte and Tablada performed a hydraulic study for restoring the Amite River Basin Weir. The project included performing detailed flow assessments for the Amite River and the Amite River Diversion Canal and determining ways to restore planned flows. A detailed hydrographic survey of the weir was performed using multi-beam wide swath sounders, sonarmite mounted on shallow water kayaks, and traditional methods to obtain a full profile of the shallow water weir and the surrounding areas.

PROJECT RELEVANCE

- H&H analysis
- Topographic survey

Challenge: The largest challenge for this project was the rapidly changing water depths along the weir. **Solution:** Forte and Tablada was able to overcome this challenge through the multiple types of data collection systems within its inventory. Forte and Tablada's multi-beam and single beam systems were utilized to collect precise bathymetric data set for the analysis of the existing weir structure. A custom kayak was fabricated for mounting the single-beam Sonarmite in order to access shallow water areas to capture cross sectional data.

Team Members: **Jonathan Coco | Steve LeBlanc, PLS | Brent Campbell**



Amite River Weir 3-D Bathymetric Survey

Firm name	**Forte and Tablada, Inc.**	Past Performance Evaluation Discipline(s)*	**Survey**
Project name	**Amite/Blind River Survey**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Livingston Parish Government
Project location	Livingston Parish, LA	Owner's Project Manager	Layton Ricks
Owner's address, phone, email	20355 Government Blvd. Livingston, LA 70754; 225-686-2266, lricks@lpgov.com		
Services commenced by this firm (mm/yy)	08/19	Total consultant contract cost ($1,000's)	$300
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)	$300

Forte and Tablada captured bathymetric profile and cross section data in the Amite and Blind River near the mouth of each river at Lake Maurepas. Bathymetric data was also collected in Lake Maurepas near the mouth of both rivers and adjacent lake banks to determine dredging spoil areas. The water bottom measurements were taken using a single-beam sonarmite in conjunction with a GPS unit utilizing base corrections via LSU C4G base network.

PROJECT RELEVANCE

- Topographic survey

Challenge: The challenge of this project was to understand the morphology of the riverbeds and to determine the location and extents of dredging. **Solution:** This was accomplished by performing a single beam bathymetric sonar survey of the extents of each riverbed and comparing the results to historical charts and records. To address the potential for disposal of dredge spoil material, the swampy areas adjacent to the river ends were surveyed using conventional GPS survey equipment and used to analyze containment capacity.

Team Members: Jace Ricard, PLS

Blind River Survey in Livingston Parish

Firm name	**Forte and Tablada, Inc.**	Past Performance Evaluation Discipline(s)*	**Survey**
Project name	**Westbank Closure Complex Multi-Beam Hydrographic Survey**	Firm responsibility (prime or sub?)	Sub
Project number	N/A	Owner's name	South Louisiana Flood Protection Authority - West
Project location	Belle Chase, LA	Owner's Project Manager	Jesse Noel, PE
Owner's address, phone, email	7001 River Road Marrero, LA 70072; (504) 371-6847; jnoel@slfpaw.org		
Services commenced by this firm (mm/yy)	09/21	Total consultant contract cost ($1,000's)	$12.5
Services completed by this firm (mm/yy)	09/21	Cost of consultant services provided by this firm ($1,000's)	$12.5

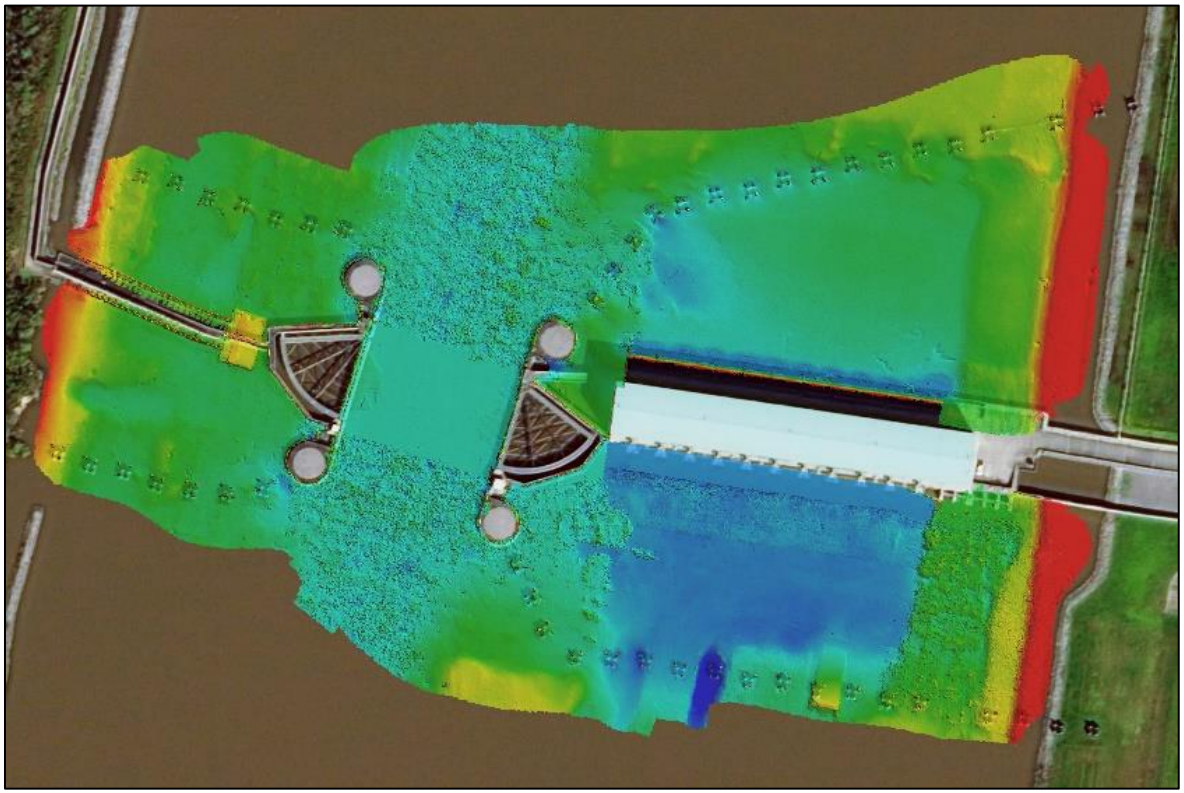
PROJECT RELEVANCE

- Topographic survey

During Hurricane Ida, the South Louisiana Flood Protection Authority - West, operated the Westbank Closure Complex near pumping capacity and was interested to know whether or not scour had formed on the outfall and suction side of the pump station. Forte and Tablada mobilized to the site within three days of Hurricane Ida's passing. Utilizing a shallow draft vessel equipped with advanced multi-beam sonar equipment, Forte and Tablada performed a comprehensive survey extended bank-to-bank of the station and beyond the protection fenders for a global depiction of scour. Scour results were presented in a color ramped elevation map, as well as imagery showing the presence of debris on an intake screen.

Challenge: One challenge was hot to mobilize multibeam hydro equipment just days after Hurricane Ida to perform urgent survey of scour and debris build up on the Westbank Closure Complex.
Solution: The team quickly mobilized shallow draft vessel with advanced multibeam hydro equipment to capture the requested scope area in high detail and provided a quick turnaround time for the deliverables.

Team Members: Brent Campbell | Spencer Rimes | Brad Holleman



Firm name	**Forte and Tablada, Inc.**		Past Performance Evaluation Discipline(s)*	**Survey**	
Project name	**IDIQ Contract for Louisiana Watershed Initiative (LWI) Modeling Region 7**			Firm responsibility (prime or sub?)	Sub
Project number	4400017093		Owner's name	DOTD	
Project location	Louisiana Watershed Initiative Region 7		Owner's Project Manager	Edward Knight, PE	
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA 70804, (225) 379-3007, edward.knight@la.gov				
Services commenced by this firm (mm/yy)	11/20		Total consultant contract cost ($1,000's)	$14.78	
Services completed by this firm (mm/yy)	Ongoing		Cost of consultant services provided by this firm ($1,000's)	$14.78	

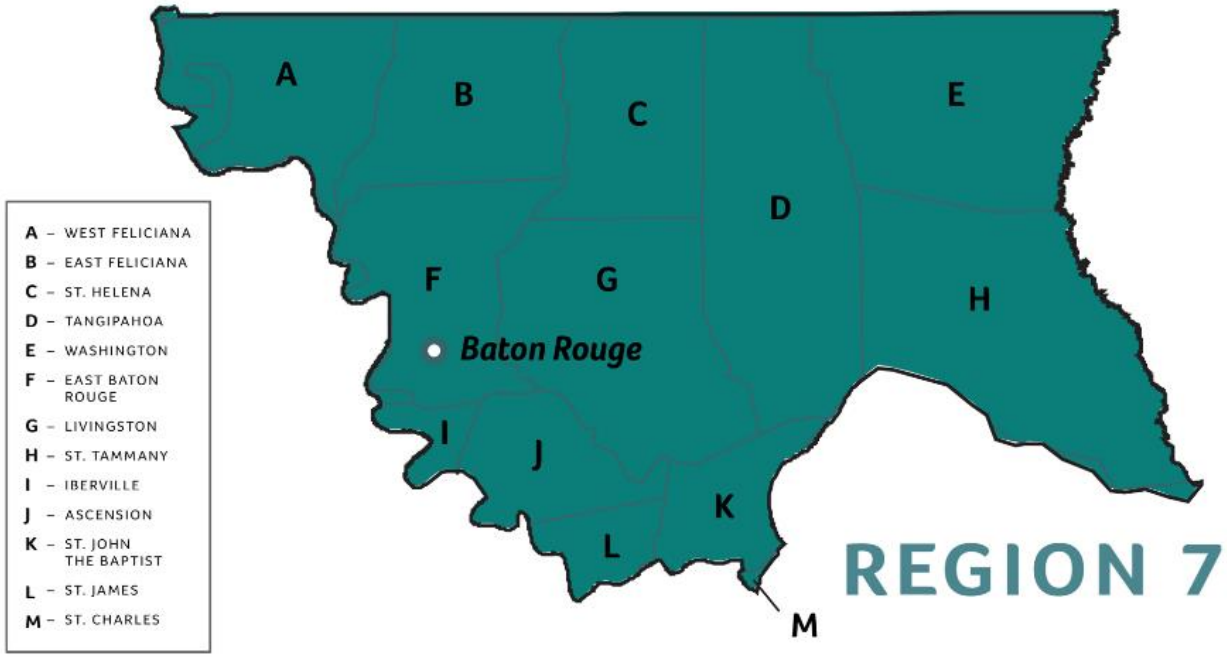
Forte and Tablada, Inc. is working with DOTD and Dewberry to provide surveying of critical waterway features throughout Region 7 which contains 13 parishes. The three primary components of the survey consist of 1) obtaining records of previous surveys 2) cross section surveys of strategic waterways and 3) surveying culvert and bridge crossings. The purpose of the surveys performed by Forte and Tablada is for regional watershed modeling performed by Dewberry.

PROJECT RELEVANCE

- Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data
- Topographic survey

Forte and Tablada performed the surveys using GPS survey equipment as well as advanced 3D modeling equipment. Above the water line, a 3D LiDAR laser scanner was utilized while under the water line multi-beam and single-beam hydrographic equipment was utilized. Two notable advancements to data collection procedures took place on this project. Forte and Tablada, along with Dewberry, were able to create a procedure to capture 3D models of bridge crossing to precisely determine the bridge opening areas. Another notable solution was the Forte and Tablada Research and Development Team's fabrication of an unmanned, remote controlled single beam hydrographic surveying device to access waterways too shallow for a manned vessel yet too deep for personnel in hip boots.

Team Members: **Brad Holleman | Jace Richard | Brent Campbell | Spencer Rimes**



Terracon Projects

Prime consultant name: **Michael Baker International, Inc.**

Firm name	**Terracon**	Past Performance Evaluation Discipline(s)*	**Geotechnical**
Project name	**Camp Whispering Pines Dam and Spillway**	Firm responsibility (prime or sub?)	Sub
Project number	N/A	Owner's name	Girl Scouts of Louisiana
Project location	Independence, LA	Owner's Project Manager	Kimberly McDaniel (Sub to CH Fenstermaker & Associates, LLC)
Owner's address, phone, email	445 North Blvd., Ste. 601, Baton Rouge, LA 70802, (225) 344-6701, kimberlym@fenstermaker.com		
Services commenced by this firm (mm/yy)	02/21	Total consultant contract cost ($1,000's)	$16
Services completed by this firm (mm/yy)	04/21	Cost of consultant services provided by this firm ($1,000's)	$16

Terracon was retained to provide a subsurface investigation and geotechnical site characterization report concerning the existing dam and levee at the Camp Whispering Pines facility. It was observed that considerable erosion was occurring on the downstream side of the existing dam spillway. The site investigation provided was used to develop a design for the repair and upgrade of the spillway on the northwest side of the existing dam.

PROJECT RELEVANCE

- Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data
- Develop alternatives to mitigate flood risk in the surcharge area above the dam without increasing flood risk downstream of the dam

The existing dam was constructed across Indian Creek in the early 1970s to contain water to create the approximately 18.5-acre lake for the camp. The dam is about 475 feet long and approximately 15 feet tall near the center point. The dam slope has an approximate 4H:1V slope on the downstream side and an estimated 3H:1V slope on the lake side. The overflow spillway is located on the northwest end of the dam and flows into a channel that inevitability drains into the Tangipahoa River. A drainpipe is located at the center of the dam with a control valve on the downstream side. Attempts were made by the owner to curtail the erosion at the top of the spillway by filling the downstream area with large amounts of recycled concrete panels/riprap.

Terracon performed 3 soil borings along the existing dam and collected three bulk samples of embankment material located at the crest of the spillway. Terracon performed laboratory testing on the samples collected to determine moisture content, Atterberg limits, particle size distribution, unconfined compressive strength, and unit weight parameters. Terracon presented the field and laboratory results in a site characterization report to facilitate design.

Challenge: The dam at the Girl Scouts camp was eroding over time. The organization had to make repairs to the dam before a failure would occur. The organization didn't have the funds up front to do all the work at one time. **Solution:** Terracon helped the design team develop a plan to fix the dam over time and not have to do a major repair that would cost a lot of money at one time.

Team Members: Steve Greaber | Brian Alexander | Matt Minton

Firm name	**Terracon**	Past Performance Evaluation Discipline(s)*	**Geotechnical**
Project name	**The Lakes at White Oak Dam & Spillway**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	The Lake at White Oak Homeowners Association, Inc.
Project location	Baton Rouge, LA	Owner's Project Manager	Wesley Valverde
Owner's address, phone, email	PO Box 77805, Baton Rouge, LA 70879, (225) 751-5715, President@lakeatwhiteoak.org		
Services commenced by this firm (mm/yy)	04/17	Total consultant contract cost ($1,000's)	$22.8
Services completed by this firm (mm/yy)	08/20	Cost of consultant services provided by this firm ($1,000's)	$22.8

Terracon performed inspection and evaluation services to determine geotechnical conditions at the site of the two weirs in 2012. We assisted in the design of repairs to mitigate the excess seepage issues identified at the lower weir structure which consisted of installation of a vinyl cut-off wall on the lake side of the lower weir to aid in minimizing infiltration around and under the concrete spillway.

The most recent project included additional independent inspection of two weirs, a report of the findings, and a maintenance work scope package.

Challenge: The dam in the neighborhood drains into the Amite River. Over time, the area continues to show signs of erosion along the spillway. The neighborhood homeowner's association knew they needed to address the issue but didn't have the funds to contract all the work at one time. **Solution** Terracon helped the HOA develop a plan to fix the dam over time and help reduce the erosion over time, thus working within the client's limited budget.

Team Members: **Steve Greaber | Lynne Roussel | Matt Minton | Brian Alexander**

PROJECT RELEVANCE

- Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data
- Develop alternatives to mitigate flood risk in the surcharge area above the dam without increasing flood risk downstream of the dam
- Determine a preferred alternative
- Preliminary Plans
- Final Plans
- Construction Proposal Services
- Construction Support

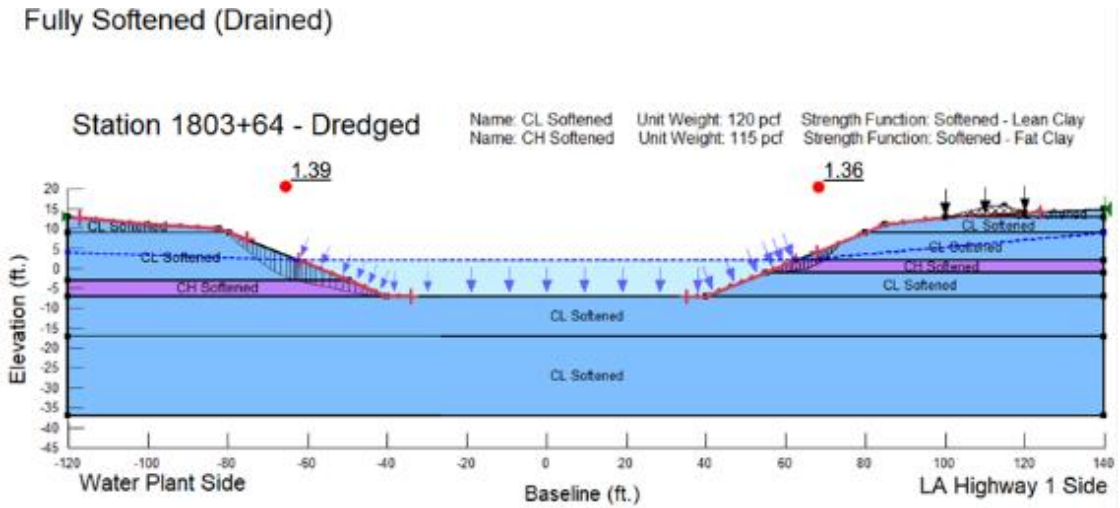
Firm name	**Terracon**	Past Performance Evaluation Discipline(s)*	Geotechnical
Project name	**Bayou Lafourche Weir**	Firm responsibility (prime or sub?)	Sub
Project number	N/A	Owner's name	Bayou Lafourche Freshwater District
Project location	Thibodaux, LA	Owner's Project Manager	Jennifer Shortess (Sub to Duplantis Design Group)
Owner's address, phone, email	314 East Bayou Rd., Thibodaux, LA 70301, (985) 447-0090, jshortess@ddgpc.com		
Services commenced by this firm (mm/yy)	11/19	Total consultant contract cost ($1,000's)	$8
Services completed by this firm (mm/yy)	04/21	Cost of consultant services provided by this firm ($1,000's)	$8

This project consisted of the removal of a weir and concrete revetment structure for the City of Thibodaux Water Plant. Also included regrading of the side slopes and deepening of the Bayou Lafourche channel over a 250-foot section. Terracon provided the geotechnical field exploration, laboratory testing and slope stability analysis.

PROJECT RELEVANCE

- Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data

Design concerns consisted of slope stability for the bayou considering construction equipment working and dredge stockpile along the edge of the bank. The analysis indicated the critical failure surface and whether it exhibited a Factor of Safety exceeding the typically recommended minimum for the slope profile and construction conditions/limitations specified. The report recommended a minimum setback from the top of the bank, and maximum footprint and height of the dredge stockpile while still maintaining the recommended Factor of Safety.



Stability was checked at the controlling slope located downstream of the weir with the estimated future low water level in a worst-case scenario and a sloping ground water condition. The soil profile and design properties were determined after reviewing the results of the laboratory testing which included compressive strength testing, Atterberg limits, and hydrometer analysis. The slope stability was analyzed with Geoslope Slope/W software utilizing the Morgenstern-Price methodology for an end of construction undrained condition with a temporary material stockpile along the bank, and a long term, drained fully softened condition with the final dredged profile. The drained condition was modeled using shear normal functions for the soil in a full softened state. The design also included placing a Class D geotextile fabric and recycled rip-rap for erosion control measures.

Challenge: The weir was in the bayou for many years and was blocking boat traffic down the bayou. The bayou was also being dredged, so the Freshwater District wanted to remove the weir. **Solution:** Terracon worked with the design team to determine a removal plan that would not disturb and damage the existing banks of the bayou. The sequence of the events had to be planned out so that a slope failure didn't occur along the bayou.

Team Members: Steve Greaber | Lynne Roussel | Matt Minton | Brian Alexander

Firm name	**Terracon**		Past Performance Evaluation Discipline(s)*	Geotechnical	
Project name	**Habitat for Humanity St. Tammany West Phase I ESAs**			Firm responsibility (prime or sub?)	Prime
Project number	N/A		Owner's name	Habitat for Humanity St. Tammany West	
Project location	Covington/Mandeville, LA		Owner's Project Manager	Al Dempsey	
Owner's address, phone, email	1400 North Lane, Mandeville, LA 70471, (985) 888-1214, adempsey@habitatstw.org				
Services commenced by this firm (mm/yy)	10/18		Total consultant contract cost ($1,000's)	$8.4	
Services completed by this firm (mm/yy)	01/19		Cost of consultant services provided by this firm ($1,000's)	$8.4	

Habitat for Humanity St. Tammany West purchased scattered lots in Covington and Mandeville for developing affordable single-family homes. For the development of these sites, Habitat for Humanity intended to utilize federal funding, specifically those from the Department of Housing and Urban Development (HUD) through the Nonprofit Open Cycle Affordable Housing (NOAH) – Homeownership Development and HOME Funding programs under the charge of the Louisiana Housing Corporation (LHC) as the Responsible Entity. Therefore, a Phase I Environmental Site Assessment (ESA) per ASTM 1527-13 and a HUD EA per 24 CFR Part 58 were required.

Terracon was contracted by Habitat for Humanity St. Tammany West to provide the Phase I ESA and the HUD EA for the scattered lots. The Phase I ESA included a site reconnaissance and a review of physical setting, historical use, regulatory records for the site. The HUD EA involved the consideration of several factors, including, but not limited to, historic preservation, floodplain management, wetlands protection, coastal zone management, endangered species, air quality, farmlands, and noise control.

The Phase I ESA found no Recognized Environmental Conditions (RECs) in connection with the sites. In addition, a finding of No Significant Impact was determined during the HUD EA.

Challenge: The project presented complexity in identifying several sources of information, agency expectations and need. **Solution:** Terracon utilized readily available information from City, Parish, State, and Federal agency websites, online applications, direct agency consultation, and HUD specific guidance to find those information sources and meet agency expectations.

Team Members: Rachel Keane

PROJECT RELEVANCE

- Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data
- Determine the level of environmental evaluation of the proposed alternative in accordance such as a Categorical Exclusion, EA or an EIS

Firm name	**Terracon**		Past Performance Evaluation Discipline(s)*	Geotechnical	
Project name	**Off System Bridge Replacements – Cedar Crest Ave. OSB Wetland Delineation**			Firm responsibility (prime or sub?)	Prime
Project number	SP H.014319		Owner's name	DOTD	
Project location	East Baton Rouge Parish		Owner's Project Manager	Rahman Bhatti (Sub to Rahman & Associates)	
Owner's address, phone, email		3645 Williams Blvd., Ste. 208, Kenner, LA 70065; 504.469.0022; rahman@rahmanandassociates.com			
Services commenced by this firm (mm/yy)		06/21	Total consultant contract cost ($1,000's)	$3.2	
Services completed by this firm (mm/yy)		Ongoing	Cost of consultant services provided by this firm ($1,000's)	$3.2	

Terracon was subcontracted by Rahman & Associates to perform wetlands delineations for several off-system bridges for DOTD. Terracon performed a WOTUS delineation at the Cedar Crest Bridge Off System Bridge Replacement project. The delineation included a desktop pre-screening to identify potential wetland and water features. Followed by a field delineation. In concurrence with Terracon's pre-screening results, at the time of the field delineation, several waters and wetland features were identified. Terracon submitted the report and obtain a jurisdictional determination from the USACE. At that time, the 2020 Water Quality Certification had been overturned and permits were able to be issued.

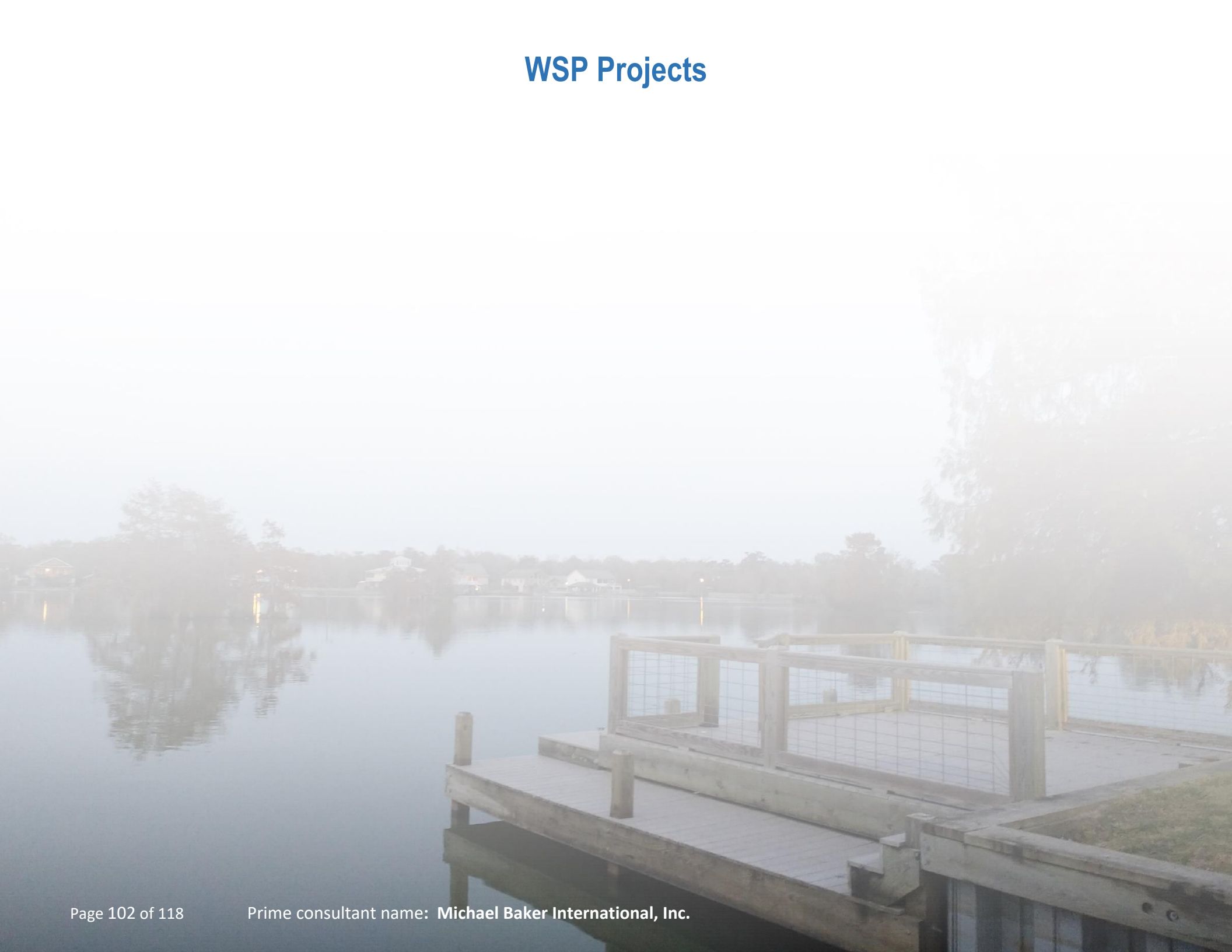
Challenge: Site boundaries needed to be adjusted in order to receive a No Permit Required determination. **Solution:** Terracon worked with the client and the USACE project manager to adjust site boundaries and implement best management practices to obtain a No Permit Required determination.

PROJECT RELEVANCE

- Assemble Existing Land Use, Topographic, Geotechnical Data, Design Data, Construction Data
- Determine a preferred alternative
- Schedule, prepare for and present the proposed alternative at conferences/meetings with affected public officials
- Required permits necessary for project execution
- Services necessary to develop a schedule of implementation and estimate costs for design, utility relocations (if necessary), construction and any environmental mitigation costs
- Services necessary to determine any and all permits required for project implementation

Team Members: Rebecca Gaspard

WSP Projects



Prime consultant name: **Michael Baker International, Inc.**

Firm name	**WSP**	Past Performance Evaluation Discipline(s)*	Data Collection; Other		
Project name	**Multiple Stormwater Pump Station Improvements**		Firm responsibility (prime or sub?)	Prime	
Project number	S.P. No H.010439, H.010565, H.972249, H.010251, and H.010253	Owner's name	DOTD		
Project location	East Baton Rouge and Jefferson Parishes	Owner's Project Manager	Sarah Golz, PE		
Owner's address, phone, email	1201 Capitol Access Rd Baton Rouge, LA 70802, 225.379.1430, Sarah.Golz@LA.gov				
Services commenced by this firm (mm/yy)	12/14	Total consultant contract cost ($1,000's)	$2.5M		
Services completed by this firm (mm/yy)	07/21	Cost of consultant services provided by this firm ($1,000's)	$800k		

Under a statewide retainer contract with the DOTD, WSP provided Mechanical and Electrical Engineering Design Services for rehabilitation of storm water pumping stations along the I-10 corridor in Baton Rouge and Metairie, Louisiana. In addition to electrical and mechanical design services, WSP provided hydraulic and architectural services for the Acadian Street Pump Station.

PROJECT RELEVANCE

- Preliminary Plans
- Final Plans
- Construction Proposal Services
- Construction Support
- Shop Drawings

Under a statewide retainer contract with the DOTD, WSP provided Hydraulic, Architectural, Mechanical and Electrical Engineering Design Services for rehabilitation of storm water pumping stations along the I-10 corridor in Baton Rouge and Metairie, Louisiana. As part of an overall program of pumping station upgrades, WSP was the prime consultant for rehabilitation effort of six (6) stormwater pump stations, providing architectural, mechanical, electrical and hydraulic design services: Task Order No. 2: Boyd Avenue Pump Station (total pumping capacity = 35.7 cfs); Old 21st Street Pump Station (total pumping capacity = 42.3 cfs); New 21st Street Pump Station (total pumping capacity = 53.5 cfs); Task Order No. 4: Acadian Street Pump Station (total pumping capacity = 6.7 cfs); Task Order No. 5: Airline Drive Pump Station (total pumping capacity = 33.42 cfs); Task also included a standby generator study for the East New Orleans Maintenance Facility and the Airline Drive Pumping Station.; Task Order No. 8 and 10: Chippewa Pumping Station (total pumping capacity = 33.42 cfs); Task included a hydrology study to compare the existing capacity to the 2-, 5-, 10-year storms, and a follow-on study to include the 25- and 50-year storms.; Task Order No. 9: Bluebonnet Boulevard Station (total pumping capacity = 23.4 cfs)

The design work included replacement of main pump controls; electrical lighting; distribution and controls; air quality sensors; new ventilation for machine room and the dry pits; main and stripper pumps; and connecting inlet and discharge piping and fittings.

Rehab upgrades ranged from upgrades to the existing diesel generator; architectural upgrades, such as new cladding, roofing, doors, vents, safety ladders; general miscellaneous cleaning and painting; removal and replacement of discharge piping at the Acadian Street Pump Station; replacing existing full-voltage starters with soft starters to minimize standby generator size.

WSP managed development of the contract plans, specifications, and construction cost estimates, and assisted in contract letting for the projects. WSP is supporting the projects throughout the construction of the new stations with design services during construction. Tasks included reviewing shop drawing submittals and responding to RFIs.

Challenge: Upgrade of the Old 21st Station involved the largest pumps in the contract and presented several challenges: (1) The stormwater pumping system's geometry necessitated an accessory vacuum pump to properly flood the impeller. **Solution:** WSP devised electrical and hydraulic controls to time and safely interlock the operation of the stormwater pumps with the vacuum pump. **Challenge:** (2) The contractor's alternate stormwater pump offering exceeded the Department's existing standby generator. **Solution:** WSP worked closely with the contractor and the Department to provide engineering analysis that included impeller design guidance to the manufacturer and service factor analysis to satisfy both pumping performance and electrical power limitations.

Team Members: David Loduca

Firm name	**WSP**	Past Performance Evaluation Discipline(s)*	Data Collection, Geotech, CE&I/OV
Project name	**Chilhowee Dam Rehabilitation & Embankment Repair**	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Brookfield Renewable
Project location	Chilhowee Dam, Tallassee Tennessee	Owner's Project Manager	Matthew Johnson
Owner's address, phone, email	399 Big Bay Road Queensbury, NY 12804, 518-743-2017, matthew.johnson@brookfieldrenewable.com		
Services commenced by this firm (mm/yy)	01/14	Total consultant contract cost ($1,000's)	$2,000
Services completed by this firm (mm/yy)	12/17	Cost of consultant services provided by this firm ($1,000's)	$2,000

Chilhowee Dam is a concrete gravity and embankment structure approx. 1,473 ft in length that consists of an integral intake/powerhouse section, tainter gate spillway section, two non-overflow concrete gravity sections and two rockfill embankment sections. It is one of four dams comprising Brookfield's 380 MW Smoky Mountain Hydro Project in North Carolina and Tennessee, that began having seepage issues during its construction in 1957.

WSP served as the Engineer or Record/Owner's Representative and developed and oversaw an extensive subsurface investigation program to determine the extent of deficient embankment materials. In parallel, WSP performed a site specific seismic evaluation, to address recent changes to the USGS hazard maps for the area of the dam. Based on the results of the subsurface program, WSP prepared the contract documents, design drawings, technical specifications, the Quality Control Inspection Program (QCIP) for a significant rehabilitation program at the site and provided on-site engineering oversight for the repair program. The repairs were successfully completed, and the reservoir restored, in the summer of 2017.

Services provided on the project included: Development & coordination of subsurface investigation; SPT and CPT borings from crest and upstream rockfill; EM studies and dye testing; Seismic refraction geophysics; Probabilistic Seismic Hazard Analysis study; Using new USGS hazard maps; FLAC analysis of project structures; FERC-required Board of Consultants; Facilitate BOC meetings and discussions; Address BOC review during planning and design; Engineer of Record and Owner's Engineer; Quality Control and Inspection Program (QCIP); Structural, Hydraulic, and Geotechnical Engineering; Monitoring and Instrumentation; Contract documents and design drawings preparation; 24/7 onsite engineering support during construction; FERC Construction Report

Challenge: The dam had long-term seepage issues through the embankment foundation that prior client efforts had been unable to sufficiently mitigate. **Solution:** WSP developed a comprehensive subsurface investigation on the embankment to identify the locations of inadequate materials that were causing seepage issues and developed contract documents for the removal of the soils and reconstruction of the embankment. **The project successfully arrested the long-standing seepage issue and was awarded the 2018 USSD Project of Year award.**

Team Members: Tom Brooks-Pilling | Thomas Smith | Bill Webb | Keith Wallace | Aida Karalic | Werner Reinfeld | Ray Cheng | Dave Loduca

PROJECT RELEVANCE

- H&H Analysis
- Perform Probable Failure Mode (PFM)
- Determine a preferred alternative
- Final Alternative Report
- Required permits necessary for project execution
- Major design features
- Environmental mitigation measures necessary
- Services necessary to develop a schedule of implementation and estimate costs for design, utility relocations (if necessary), construction and any environmental mitigation costs
- Services necessary to determine any and all permits required for project implementation
- Topographic Survey
- Preliminary Plans
- Final Plans
- Construction Proposal Services
- Construction Support
- Shop Drawings
- HEC – HMS

Firm name	**WSP**	Past Performance Evaluation Discipline(s)*	Data Collection
Project name	**Ashokan Reservoir Reconstruction Project**	Firm responsibility (prime or sub?)	Sub
Project number	N/A	Owner's name	New York City Department of Environmental Protection
Project location	Ulster County, NY	Owner's Project Manager	Melissa Beristain
Owner's address, phone, email	59-17 Junction Blvd, Flushing, NY 11368, (646)457-8799, mberistain@dep.nyc.gov		
Services commenced by this firm (mm/yy)	06/18	Total consultant contract cost ($1,000's)	$30
Services completed by this firm (mm/yy)	On-going	Cost of consultant services provided by this firm ($1,000's)	$9

The Ashokan Reservoir is a critical part of the New York City water supply system, supplying about 40% of New York City's daily drinking water. Completed early in the 20th century and placed into service in 1915, the reservoir's dam and associated structures are more than 100 years old.

WSP, as a major and integrated subconsultant, is providing engineering services for structures associated with the Ashokan Reservoir, including the Dividing Weir, Dividing Weir Bridge and the Ashokan Spillway. The main goals of the project are to rehabilitate the reservoir system to ensure continued water service for another 100 years, provide adequate hydraulic capacity through the spillways, and minimize downstream impacts, while maintaining water quality and vehicular access during construction. WSP is evaluating several design alternatives through 2D and 3D hydraulic modeling, with consideration of feasibility, relative costs, benefits, risks, and mitigation measures. WSP will provide design services for the selected designs as well as permitting and construction support services.

WSP performed the PMP / PMF update determination during preliminary design and prepared a HEC-RAS2D model of the entire reservoir, including the dividing weir, dividing weir bridge, and the spillway. The project team is currently developing CFD models of the primary spillway and the dividing weir for evaluation of the design alternatives. The CFD modeling is being supplemented by physical modeling of the primary spillway to provide the highest level of modeling support for this key piece of infrastructure. Results of the CFD model are being used by the team to demonstrate turbulent conditions through the spillway and to determine the limits / focus the needs of the physical modeling exercise.

Challenge: The reservoir has a complex series of hydraulic interactions driven by the dividing weir that separates the east and west basins and the complex outlet spillway. **Solution:** WSP developed a large scale 2D model of the entire reservoir to simulate flow conditions between the basins and a detailed CFD (3D) model of the dividing weir and the spillway to provide a high level of detailed analysis of the critical structures.

Team Members: Tom Edwards | Ahintha Kandamby

PROJECT RELEVANCE

- Derive the Probable Maximum Flood (PMF)
- Develop alternatives to mitigate flood risk without increasing flood risk downstream
- Determine a preferred alternative
- Final Alternative Report
- Schedule, prepare for and present the proposed alternative
- Categorical Exclusion, EA or an EIS
- Required permits necessary for project execution
- Major design features
- Environmental mitigation measures necessary
- Services necessary to develop a schedule of implementation and estimate costs for design, utility relocations (if necessary), construction and any environmental mitigation costs
- Services necessary to determine any and all permits required for project implementation
- Utility Relocation
- Preliminary Plans
- Final Plans
- HEC – RAS (most recent release)

Firm name	**WSP**	Past Performance Evaluation Discipline(s)*		Data Collection	
Project name	**Phillips 66 Company Sweeny Refinery Complex San Bernard Reservoir No. 4**			Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name		Phillips 66 Company	
Project location	Ulster County, NY	Owner's Project Manager		John Landry	
Owner's address, phone, email	8189 Old FM Rd, Old Ocean, TX 77463, (979) 491-2006, John.Landry@contractor.p66.com				
Services commenced by this firm (mm/yy)	01/14	Total consultant contract cost ($1,000's)		$500	
Services completed by this firm (mm/yy)	12/15	Cost of consultant services provided by this firm ($1,000's)		$500	

WSP was commissioned by Phillips 66 Company (P66) Sweeny Refinery Complex to develop a design, permitting, and bid package for a new river intake pump station, storage reservoir, and pipeline system to deliver diverted water to a reservoir. As part of the scope of work, WSP also prepared detailed design and permitting documents for submittal to the TCEQ Dam Safety program.

WSP designed the San Bernard River Pump Station and intake structure, which delivers 10,000 gpm to the storage reservoir, but can be upgraded to 30,000 gpm in the future. The station includes two vertical turbine pumps with a third pump bay vacant for future use. Flow to and from the reservoir was designed to be monitored in the station PLC and at the refinery complex.

The storage reservoir, was designed as an off-channel, aboveground impoundment located approximately 4,200 feet northeast of the pump station. The approximately 7,000-foot long, 20-foot high reservoir embankment will be constructed from onsite borrow soils with a hybrid of 3H:1V and 4H:1V embankment slopes, and store a normal pool volume of 5,435 acre-feet of river water until downstream demand at the refinery requires the water use. A primary outlet pipe, primary spillway, and emergency spillway were included in the hydraulic design of the reservoir. Under normal operating conditions, the reservoir will discharge a maximum flow rate of 61,670 gpm back to the San Bernard River, which will flow downstream and be diverted again at the refinery intake station.

Challenge: One challenge was developing a design that would be able to meet present and future site demands. **Solution:** WSP designed pump station to meet present demands with a vacant bay for an additional pump to meet future demands

Team Members: **Gregg Hudock | Steven Cribb | Michael Chilson**

PROJECT RELEVANCE

- Derive the Probable Maximum Flood (PMF)
- Determine a preferred alternative
- Final Alternative Report
- Schedule, prepare for and present the proposed alternative at conferences/meetings with affected public officials
- Categorical Exclusion, EA or an EIS
- Required permits necessary for project execution
- Major design features
- Services necessary to determine any and all permits required for project implementation
- Preliminary Plans
- Construction Support
- Shop Drawings
- MicroStation
- HEC – HMS
- HEC – RAS (most recent release)

Firm name	**WSP**		Past Performance Evaluation Discipline(s)*	Data Collection	
Project name	**Moodna Creek Watershed / Blooming Grove Flood Study**			Firm responsibility (prime or sub?)	Prime
Project number	N/A		Owner's name	Town of Blooming Grove	
Project location	Orange County, NY		Owner's Project Manager	Robert A. Fromaget and Robert Jeroloman	
Owner's address, phone, email	1201 Capitol Access Rd Baton Rouge, LA 70802, (225) 379-1430, supervisor@bloominggrove-ny.gov				
Services commenced by this firm (mm/yy)	08/15		Total consultant contract cost ($1,000's)	$650	
Services completed by this firm (mm/yy)	01/18		Cost of consultant services provided by this firm ($1,000's)	$467	

Following extensive damage caused by Hurricane Irene and Tropical Storm Lee, WSP was selected to develop a holistic flood study and capital improvement master plan for the Moodna Creek Watershed in Orange County, NY. The purpose of the Plan is to assess, quantify, and mitigate present and future flood risks of the affected municipalities. Project work encompassed data collection, modeling, design, and flood consequence and impact assessment, and evaluation of conceptual solutions that met flood protection standards and accounted for natural habitats in each area. For this effort, we created an integrated hydrologic and hydraulic model of all local waterways and hydraulic structures.

Data collection and modeling efforts included 131 bridges, culverts, and dams within the 45-square mile watershed. A watershed scale HEC-HMS hydrologic model was used to evaluate flood flows for a series of design storms. HEC-SSP was used for analysis of USGS river gauges and applied for calibration of the HEC-HMS models. Riverine flooding was simulated using a combined one-dimensional and two-dimensional HEC-RAS hydraulic model. HEC-DSS was utilized to integrate the models. The HEC-RAS model was developed as a coupled 1D channels and 2D overbank flow area model to accurately simulate river discharge and stage within the stream channels and across the floodplain.

Flood Risk Assessment, Consequence Analysis, Mapping, and Mitigation: Together, these models were used to quantify flood risks throughout the project area, and gain understanding about underlying flood mechanisms. From the model results, we developed a suite of flood mitigation projects and provided the communities with a clear path to implementation. The team performed HEC-FIA analysis of flood impacts based on existing GIS land cover data sets combined with property valuation data. Conceptual implementation of flood mitigation measures was integrated into the HEC-RAS model to demonstrate protection benefits with re-evaluations performed using HEC-FIA and HEC-FDA. The final deliverable was a prioritized list of projects that will provide the municipalities with a roadmap to implementation. Our prioritization framework used the flood consequence financial analysis along with a multi-criteria analysis to comprehensively evaluate the benefits of the proposed flood mitigation projects.

PROJECT RELEVANCE

- Develop alternatives to mitigate flood risk without increasing flood risk downstream
- Determine a preferred alternative
- Schedule, prepare for and present the proposed alternative
- Required permits necessary for project execution
- Major design features
- Services necessary to develop a schedule of implementation and estimate costs for design, utility relocations (if necessary), construction and any environmental mitigation costs
- Topographic Survey
- Preliminary Plans
- Final Plans
- Construction Proposal Services
- Construction Support
- Shop Drawings
- HEC – SSP
- HEC – HMS
- HEC – RAS (most recent release)
- HEC – FIA
- HEC – FDA

Challenge: Following extensive damage caused by Hurricane Irene and Tropical Storm Lee, WSP was selected to develop a wholistic Drainage Master Plan for several communities, including Blooming Grove, in the Moodna Creek Watershed in Orange County, New York. **Solution:** To address the breadth of such an undertaking, WSP created a comprehensive, integrated H&H model of all local waterways, hydraulic structures, and stormwater structures, and developed a suite of flood mitigation projects and provided the community with a prioritized list of projects and clear paths to implementation.

Team Members: Tom Edwards

18. APPROACH AND METHODOLOGY

Michael Baker, led by local **Project Manager Jade Rung, PE, PMP,** will deliver the same exceptional service to DOTD that we have gained a reputation for across the country. Our client satisfaction speaks for itself in terms of our knowledge, dedication, and ability to deliver a quality project within the budget and on schedule. We will team with industry-leading experts **WSP** (H&H support and specialty software), **Forte & Tablada** (survey), and **Terracon** (geotechnical and environmental support).

1. Data Collection and Site Inspections

A proper dam assessment requires boots-on-the-ground with experienced personnel. While onsite, **our team will verify existing issues and identify new issues. Michael Baker will perform a comprehensive site inspection and assessment at the project start at each dam site.** This will include personnel from the Michael Baker team, representatives from DOTD, and Louisiana Dam Safety (optional). Conversations with dam operators and maintenance staff will happen during site visits, and their feedback and concerns will be documented. In addition to a visual inspection of the dams, the team will assess and operate the outlet works as appropriate, perform a structural inspection and evaluation of spillways or appurtenant structures, and locate borings for geotechnical investigations.

The importance of a comprehensive subsurface investigation is critical in the early design stages. Incomplete or outdated subsurface information can result in a design that is over or under conservative. Inaccurate or incomplete subsurface information may result in costly change orders during construction. For this contract, **Michael Baker has teamed with Terracon, a team member we have successfully worked with for years on past dam subsurface investigations and geotechnical engineering.** Our team will review all available information (past investigations, piezometric data, geological, soils, seismic, environmental, etc.). **Don Green, PE**, and **Steve Greaber, PE**, will lead the **development of a subsurface exploration plan** for each site, to provide subsurface data required where modifications may be conducted.

During the early phases of the project, we will **perform a topographic survey/LiDAR of each site**, including the embankment (including the upstream, crest, and downstream slopes), spillways, piezometers, boring locations, control points, utilities, and any other surface features. **LiDAR survey will help identify embankment cracks.** Led by **Chris Gesing, PE**, Michael Baker's team of engineers and environmental specialists will also conduct the required wetland investigation to determine potential project impacts and mitigation strategies.

1.1 Environmental Evaluation

The Michael Baker environmental team will provide all services required to meet the requirements of DOTD "Stage 1 – Planning/Environmental Manual of Standard Practice" for the proposed alternative at each location. Prior to receiving HUD funding, a NEPA review must be conducted. Our team will prepare for review and approval Environmental Review Records that are Categorically Excluded SUBJECT TO §58.5, EAs, and if needed, EIS, in accordance with 24 CFR Part 58 to include the following:

- ERR Summary Sheet
- Compliance Checklist for 24 CFR §58.6
- Statutory Checklist - §58.5 Compliance
- Worksheet for 24 CFR §58.5 Checklist
- EAs and EIS
- Supplemental Reports

To prepare these documents and perform the associated analysis, we will perform these tasks:

- Conduct Section 106 Consultation with the applicable State Historical Preservation Office, and United States Fish and Wildlife
- Prepare consultation letters for the government agency to contact Native American tribes
- Review FEMA floodplain maps and municipal provided GIS
- Perform air quality analysis calculations
- Utilize the HUD Acceptable Separation Distance Electronic Assessment Tool to determine explosives and flammable operations hazards
- Complete Hazardous Materials and Chemical Substance Review by either conducting a Phase I Environmental Site Assessment per ASTM1527-13 or a by performing the review in accordance with ASTM 1528-14, Standard Practice of Limited Environmental Due Diligence: Transaction Screen Process
- Utilize the HUD developed Day/Night Noise Level Calculator
- Perform a desktop review of cultural resource sites utilizing the state's historical database

The information collected and analysis conducted will be uploaded into HUD's online system (HERO) for review by HUD or a responsibility entity as well as the public. NEPA's goal is "to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment".

A project is highly successful when its deliverables provide the client with a clear, easy to use tool for regulatory compliance. Our team has the experience and expertise deliver such a regulatory tool.

2. H&H Modeling and Design Criteria Coordination

According to National Inventory of Dams (NID) data, the 3 dams in Group 1 are currently classified as having low or high hazard potential. There is no existing dam at Three Mile Lake.

Project Name	NID ID	Dam Length (ft)	NID Height (ft)	Spillway Width (ft)
Bundick Creek Dam	LA00006	8454	46	200
Anacoco Lake Dam	LA00001	5275	43	500
Vernon Lake Dam	LA00022	5170	56	300
Max Discharge (cfs)	**NID Storage (ac-ft)**	**Normal Storage (ac-ft)**	**Hazard Potential**	**Drainage Area (sq mi)**
38100	57,500	9,200	High	208
55500	82,500	24,000	Low	209
29100	99,473	57,000	High	112

Michael Baker is the prime consultant for LWI Region 6 H&H modeling, and we are very familiar with LWI Guidance on Modeling Methodology. We will also coordinate with DOTD Dam Safety Program to determine the H&H design criteria such as Inflow Design Flood (IDF) for various impact classifications (Low: 50-yr; High: ½ PMF per Dam Safety Rules and Regulations).

2.1. NOAA Atlas 14 Precipitation and PMF Events

PMF events will be developed for each site based on the 2019 study of "Regional Probable Maximum Precipitation Study for Oklahoma, Arkansas, Louisiana, and Mississippi Final Report". The PMP developed in the 2019 study will be used to develop the design PMF by using the supplied ArcGIS plugin. As shown in ***Figure 1***, 17 PMF can be developed using the 2019 PMP method for a single basin. **To ensure that the most critical event is captured, Michael Baker will model each basin and use the most critical one for final design.**

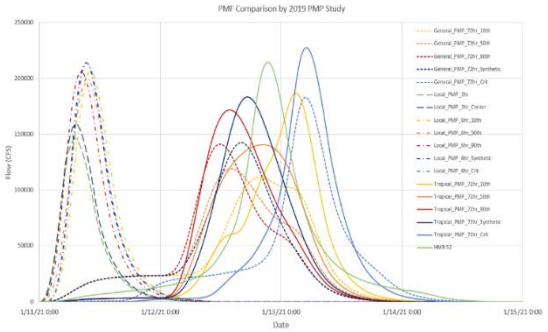


Figure 1: PMF by 2019 PMP Study -Vernon Lake Dam

Other storm events including 25-yr, 50-yr, 100-yr, 200-yr, and 500-yr design storms are to be generated using the latest NOAA Atlas 14 precipitation depths. The frequency storm method, available in HEC-HMS, will be used to generate the temporal distributions. Like the previous SCS distributions, the frequency storm is a "nested" storm, which means the precipitation depths of various shorter storms are embedded inside a longer storm event and thus a single model run using the longer storm event will be able to evaluate other short storm events simultaneously.

2.2 Hydrology

Mohamed Bagha, PE, CFM, PMP, with assistance from **Jim Han, PE, CFM**, will lead the H&H tasks. Existing hydrology models, particularly those from LWI studies, will be evaluated and utilized before establishing a new HEC-HMS model. In HEC-HMS, we will use Gridded Deficit and Constant for infiltration loss and ModClark for rainfall-runoff transformation as required by LWI Guidance on Modeling Methodology. Watersheds upstream of dams will be delineated, storms will be routed, and outflow hydrographs will be created by applying different frequency storm events and PMF events. Efforts will be made to calibrate or validate the calculated hydrographs and peak flows using gaged flow data or Louisiana regional peak flow regression analysis. We will use USGS maximum flood-envelope in NSS software or USACE chart of largest measured discharges vs. drainage areas to validate the calculated PMFs.

2.3. Hydraulics

Both HEC-HMS and HEC-RAS will be used for dam hydraulic analysis. A HEC-HMS model (Upstream Basin + Reservoir with outlets and spillways under IDF) is to be established to evaluate a dam's existing performance and various improvement alternatives. HEC-HMS is primarily a hydrology modeling tool with built-in functions to model reservoirs and various outflow structures. Usually, **HEC-HMS is more stable and takes less time to run than HEC-RAS, which makes it a perfect tool for reservoir modeling during the conceptual design stage.**

HEC-HMS reservoir modeling has its drawbacks, for example, it cannot dynamically account for tailwater effect, and it cannot be used to model downstream floodplain inundation and impact from a controlled or uncontrolled/dam breach reservoir release. For the preferred alternative, **a 1D or 1D-2D coupled HEC-RAS dynamic model will be developed to refine the preferred alternative and evaluate any potential adverse impact downstream or upstream of the project site.** We will review HEC-RAS models developed by others including LWI studies and update them by incorporating additional data from survey and as-built plans and leverage new features available in HEC-RAS during the model development phase.

2.4. Three Mile Lake Backwater Flood Reduction Project - H&H considerations

Three Mile Lake is a waterfront neighborhood located in St. Landry Parish to the west of the Atchafalaya Basin. It experiences periodical flooding from inadequate interior drainage and potential backwater effect from high water of the Atchafalaya River. Due to the shape and size of the watershed, runoff from the north (upstream) has a lingering impact on Three Mile Lake. To better understand the flow patterns of Three Mile Lake, a preliminary HEC-RAS 2D rain-on-grid model was set up for 25-yr, 100-yr and 500-yr NOAA Atlas 14 storm events.

On the east side of the lake, Two Mile Bayou (Two O'clock Bayou) normally runs north to south passing through Three Mile Lake. When the lake's water level is low and the channel downstream has a high water, Two Mile Bayou downstream may reverse the flow direction (***Figure 2***), which results in both sides of the bayou discharging to the lake and causing significant floods. **To prevent water from entering the lake from both sides during a storm event, we propose a closure structure upstream and an upsized culvert crossing with a flap gate downstream at US 190.**

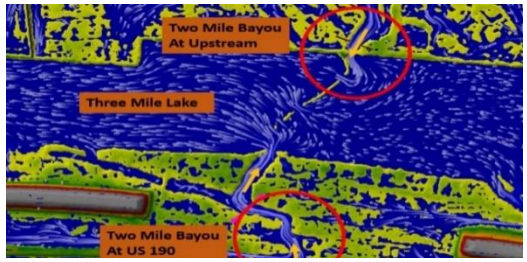


Figure 2: 2D Velocity Tracing at Two Mile Bayou

On the west side of the lake, an existing elevated driveway on an embankment separates the lake from Darbonne Bay (***Figure 3***). During extreme storm events, the high water elevation in the lake overtops the driveway to outfall into Darbonne Bay. **Building a dike there may impede the water releasing through overtopping and keep high water level at the lake for a much longer duration.** During conceptual design stage of the project, this 2D model will be refined, and a 1D-2D coupled HEC-RAS model may be developed to better understand impacts of various alternatives to ensure drainage improvement do not cause any adverse hydraulic impact.

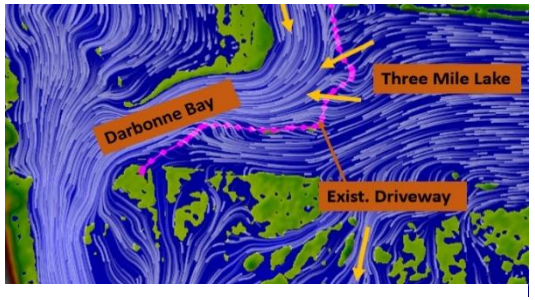


Figure 3: 2D Velocity Tracing at Darbonne Bay

3. Alternatives Evaluation and Conceptual Design

After site visits, sub surface investigations and robust modeling are used to identify deficiencies and determine their magnitudes, **we will identify specific objectives and constraints for each dam.** These will be developed by considering feedback from stakeholders and DOTD staff.

Examples of objectives include increasing spillway capacity to pass the IDF, removing utilities within embankment, minimizing environmental impacts, adding gates to uncontrolled spillways, and reducing embankment erosion from wave action. **Examples of constraints** that cannot be violated include no increase in upstream or downstream flood risk, and no increase in dam height (which increases the inundation pool upstream). **Feasible alternatives will then be developed to address the deficiencies at each dam site. The hydraulic performance of each alternative will be clearly quantified using H&H models. The modeling will consider a range of flood frequencies. Cost estimates for each alternative will be developed.** The cost estimates will consider the future maintenance costs associated with each alternative.

The environmental impacts and benefits of each alternative will be identified, and the permit requirements for each will be noted. The impacts to existing utilities will be considered in the analysis. These performance indicators (benefits, costs, environmental impacts, and maintenance needs) will be utilized to evaluate alternatives. **In no case will an alternative be proposed that raises the 1% annual chance water surface elevation at any location upstream or downstream of each dam. This is a critical constraint that cannot be violated.**

We will include documentation from the geotechnical, H&H, and structural analyses performed during the preliminary engineering phase; **Potential Failure Mode (PFM)** evaluations for each of the projects, preliminary design alternatives with associated pros and cons, evaluations, and associated construction costs estimates for each alternative; and recommendations on prioritization of work. Evaluations will consider such metrics as overall costs, risk, constructability, life span, etc. Michael Baker will also hold review meetings with DOTD at each phase to ensure the project goals and schedules are being met.

3.1. Typical Project Deficiencies and Solutions

We understand the known deficiencies at the projects include **seepage through the embankments, overgrown vegetation, animal burrows, concrete deterioration at the spillways and outlet works, inadequate spillway capacity, and inadequate flood reduction benefits**. Michael Baker has experience addressing all the deficiencies, as detailed in our project descriptions, and the anticipated technical approaches to addressing some of the typical deficiencies or modifications at each of the dams are summarized in the following paragraphs.

Deficiency: Uncontrolled Seepage/Obsolete Drainage System – Seepage concerns have been noted at several of the dams, and seepage through dam embankments is a common issue. **Solution: Seepage Control and Monitoring** – Measures to control seepage and monitor seepage will likely include new filters and drains, toe drains, and seepage monitoring weir boxes. Piezometers may also be installed to monitor water levels.

Deficiency: Inadequate Spillway Capacity – One of the most common deficiencies at older dams is insufficient spillway capacity. We understand that the spillway capacity and/or flood storage capacity is inadequate for the projects. **Solution: Updated H&H Analysis, Spillway Modification/Replacement, Auxiliary Spillway, Increasing Storage, Overtopping Protection** – When it comes to addressing insufficient capacity, there are numerous solutions, and the optimal approach varies with individual site constraints. Solutions may include replacing the spillway outright with a high-capacity spillway such as a labyrinth weir, providing overtopping protection on the embankment to convey flows while protecting the embankment, widening the principal spillway, lowering the principal spillway crest elevation (increasing capacity), and/or raising the embankment to increase the storage capacity. For some dam configurations, the most economical solution may be to install roller compacted concrete (RCC) overtopping protection on the embankment. **We will evaluate the most effective design solutions on a site-by site basis for DOTD's dams.**

Michael Baker has extensive experience in addressing insufficient capacity:

1. At **Somerset Lake Dam**, a replacement labyrinth spillway was constructed, and the embankment height was raised. The new spillway increased conveyance capacity and the raised embankment provided additional storage capacity.
2. At **Lake Loramie**, a labyrinth spillway was designed and constructed to provide the necessary hydraulic capacity and did not require the embankment to be raised.
3. At **Donegal and Chapman Lake Dams**, the spillway was rehabilitated or replaced in-kind and RCC overtopping protection was installed to meet the dam safety

Deficiency: Deteriorated Structures – Consistent with typical dams and concrete structures of their age, the concrete spillways and other structures at the dams show some deterioration, cracking, spalling, and other deficiencies. **Solution: Concrete Repairs/Replacement** – Michael Baker has extensive concrete inspection and assessment experience determining if dam repair or replacement is required. Michael Baker has prepared plans and specs for concrete repairs of spillway walls, slabs, weirs, pipe joints, and pipe end sections. If repair is not feasible or the most effective option, **Michael Baker has designed replacement structures for spillways, gates, and conduits. We have also developed plans for partial replacement of spillways,** such as on the Chapman Dam project where the spillway slabs had exhibited signs of uplift and prior movement due inadequate drainage. However, the training wall of the spillway and stilling basin were in good condition and did not require replacement. By focusing the repairs to the slabs, the cost of the spillway rehabilitation was significantly reduced. We have also developed designs that focus on the repair of existing concrete.

3.2. Geotechnical Assessment and Design

Don Green, PE, and **Steve Greaber, PE**, will lead the review of available geotechnical analyses and reports, including original design documentation. The existing geotechnical information and the information obtained from the subsurface investigations will then be used to develop a comprehensive understanding of subsurface conditions at the site. Stability and seepage analyses will be performed to analyze the existing dam configuration as well as any potential design alternatives needed to meet current dam safety requirements. Depending on the results, some **improvements that may be evaluated include slope flattening (to meet stability and seepage requirements or to improve maintenance activities), minor embankment modifications, raising embankment heights, incorporation of toe berms, and inclusion of seepage collection and monitoring systems.** Stability analysis for training walls and other structures will also be performed.

3.3. Structural Evaluation and Design

Structural evaluations will be performed for the spillways, stilling basins (including slabs, walls, chutes, etc.), control tower structures, and appurtenant structures. The stability of these critical

structures will also be evaluated to ensure the proper factors of safety are met. Based on the assessments, structural rehabilitation or replacement options will be detailed.

3.4. PFMs and SQRA

Michael Baker will evaluate PFMs as part of a Semi Quantitative Risk Assessment (SQRA) for each of the projects. SQRA defines risk as the probability of failure multiplied by the consequences. Our analysis will utilize the condition rating for different components as the semi-quantitative risk of failure. Various consequence categories will be selected and assigned in cooperation with DOTD. The results of the PFM evaluation and SQRA will be used to ensure conceptual designs address all required project modifications and meet safety requirements.

4. Detailed Design

Michael Baker will develop drawings, cost estimates, design reports, and detailed project schedules. These documents will be maintained throughout the design process in accordance with DOTD procedures. We will meet with DOTD at each milestone to review progress, recommendations, and comments. **For efficiency, we propose to advance designs for all projects in parallel, thereby combining submissions, review meetings, and other items.**

5. Project Management and Additional Information

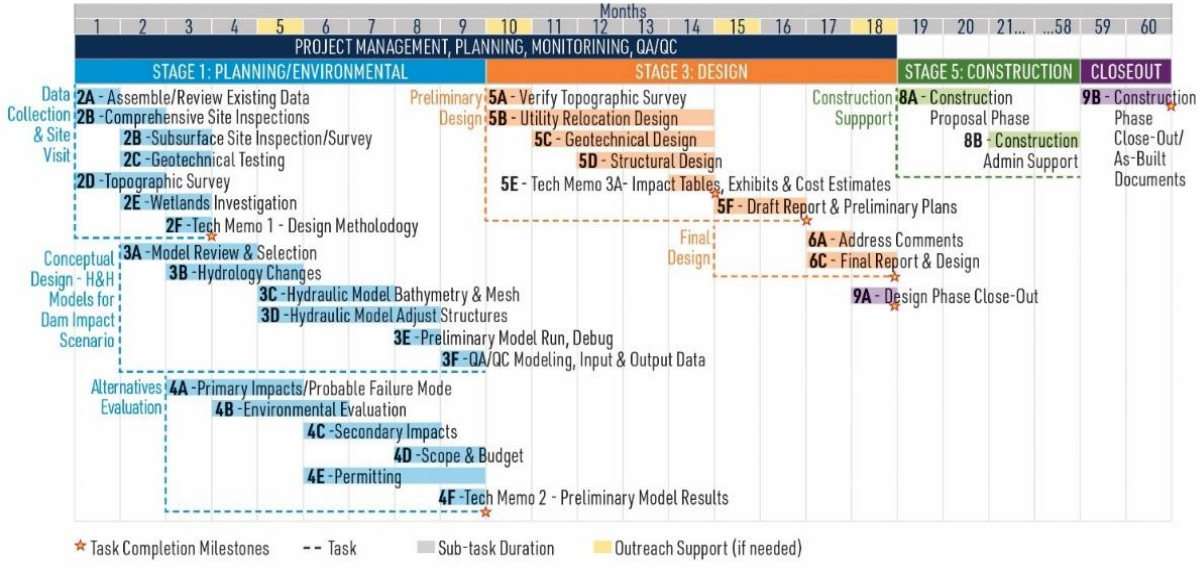
For this contract, Michael Baker's **Project Manager, Jade Rung, PE, PMP,** will also serve as DOTD's Point of Contact for. Mr. Rung's experience working on and managing complex dam and levee design projects for multiple state and federal agencies will provide DOTD with confidence that this project will be executed to a high standard.

In executing any project, the Michael Baker team follows project management practices outlined in our "**Michael Baker Way"** program, which provides a standardized and disciplined program/project management approach. The ultimate objective of the Michael Baker Way is improving project performance through p**roduct delivery excellence.** Prior to project kickoff, **Mr. Rung will develop a Project Specific Management Plan (PSMP) to ensure successful project delivery throughout the life of this project.** The PSMP clearly communicates the project scope, schedule, and budget to the management and design teams. Once approved, Mr. Rung will hold a kickoff meeting with DOTD, and the Michael Baker team, including subconsultants, to present the PSMP. A typical PSMP includes the following items:

- Project Purpose
- Scope of Work and Contract
- Critical Assumptions and Constraints
- Team and Stakeholders
- Communication Plan
- Procurement and Subcontracting
- Schedule
- Budget and Invoicing
- Quality Management Plan
- Risk Management Plan
- Change Management Plan
- Safety and Occupational Health
- Project Closeout Plan

The quality of our projects is evident in the fact that we have built long-term relationships with many of our clients, including for dam rehabilitations. More than 80% of Michael Baker's workload is repeat business, which is directly attributable to our commitment to delivering quality projects. Our clients have the peace of mind that comes from knowing that their projects will be completed on time without cost overruns. **Steve Kramer, PE**, will serve as **Quality Control Lead.** Mr. Kramer will be responsible for reviewing all deliverables prior to submission and for providing senior-level technical guidance throughout the project. Mr. Kramer has served as Quality Control Manager for multiple similar past dam rehabilitation and improvements projects.

Our proposed **schedule** for the project is outlined below.



6. Construction

Once a contractor is selected and under contract, the Michael Baker **construction support lead, Mary Flynn, PE**, will assist the DOTD Project Manager with receiving and documenting RFIs and Shop Drawings from the CE&I Field Engineer. Once RFIs and Shop Drawings are logged, the Michael Baker construction support lead will submit the RFI and/or Shop Drawing to the Project Manager to be distributed to our design team for review and approval regarding conformance to the construction plans, the 2016 DOTD Standard Specifications, and DOTD Bridge Manual. Michael Baker will assist in any RFIs if the contractor needs additional clarification of the intent of the construction plans before they can proceed. **RFIs and Shop Drawings will be reviewed in a timely manner as to not incur any additional delays for the contractor which can lead to requests for change orders for additional compensation.**

7. Work Zone Training Requirements (WZTR)

It is required by DOTD that consultants providing services have personnel that deal with traffic control and flagging be certified as Flaggers, Traffic Control Technicians (TCT), Traffic Control Supervisor (TCS) and/or combination of all three. **All relevant team personnel have received this training and certifications can be provided, if necessary, at request of DOTD.**

19. WORKLOAD

Firm(s)	Past Performance Evaluation Discipline(s) *	State project number	Project name	Remaining Unpaid Balance**
Michael Baker	Environmental	S.P. No. H.005168 F.A.P. No. DE-9208 (500)	NORG-Jefferson Highway EA, New Orleans, Louisiana Supplemental Agreement	$848,475
	Environmental, Road, Bridge	S.P. No. H.005168	NORG – Avondale PEL Study, New Orleans, Louisiana Supplemental Agreement	$1,017,881
	CE&I/OV	Contract No. 4400015166 S.P. No. H.007288.6 (CE&I) F.A.P. No. H007288	Montgomery St. (LA 34 – I-20), City of West Monroe, Ouachita Parish	$58
		Contract No. 4400014845 Task Order No. H.012018.6 S.P. No. H.012018.6 F.A.P. No. H012018	Adaptive Traffic Signal and Implementation, Lafayette Parish	$428,956
		Contract No. 440001485 Task Order No. H.0003184.6 S.P. No. H.003184.6	IDIQ Contract for Construction Engineering and Inspection Services with majority of work in District 07, I-10: Texas State Line - E. of Coone Gully, Calcasieu Parish	$908,649
		Contract No. 4400013851 Task Order No. H.013271.6 S.P. No. H0.013271.6 F.A.P. No. H.013271	IDIQ Contract for Construction Engineering and Inspection Services for Safety Projects (CE&I), Statewide Tangipahoa PH Local Road Safety Upgrade, Tangipahoa Parish	$119,176
		Contract No. 4400013851 Task Order No. H.013271.6-2 S.P. NO. H.013271.6-2 F.A.P. No. H013271	IDIQ Contract for Construction Engineering and Inspection Services for Safety Projects (CE&I) Tangipahoa PH Local Road Safety Upgrade, Tangipahoa Parish	$41,794
		Contract No. 4400013851 Task Order No. H.013271.6-3 S.P. NO. H.013271.6-3 F.A.P. No. H013271	IDIQ Contract for Construction Engineering and Inspection Services for Safety Projects (CE&I) Tangipahoa PH Local Road Safety Upgrade, Tangipahoa Parish	$23,282
		Contract No. 4400013841 Task Order No. H.012473.6 S.P. No. H.012473.6 F.A.P. No. H012473	IDIQ Contract for Construction Engineering and Inspection Services for Safety Projects (CE&I), Statewide Marconi Dr. Shared-Use Path	$41,794
		Contract No.4400013851 Task Order No. H.009308.6S.P. No. H.009308.6F.A.P. No. H009308	IDIQ Contract for Construction Engineering and Inspection Services for Safety Projects (CE&I), Statewide New Orleans DPW SRTS Sidewalk Project	$242,450

Firm(s)	Past Performance Evaluation Discipline(s) *	State project number	Project name	Remaining Unpaid Balance**
		Contract No.4400013851 Task Order No. H.012527.6 S.P. No. H.012527.6 F.A.P. No. H012527	Local Road Safety Upgrade (W. Feliciana) West Feliciana Parish	$197,450
		Contract No.4400013851 Task Order No. H.013082.6 S.P. No. H.013082.6 F.A.P. No. H013082	Bootlegger Road Sidewalks St. Tammany Parish	$175,791
	ITS	Contract No. 4400011253 S.P. No. H.011500.6	Retainer Contract for Intelligent Transportation Systems (ITS), Lake Charles ITS Phase 3	$25,659
	Other	Contract No. 4400019130 Task Order No. 1	IDIQ Contract for Statewide Aviation Program Update – Phase II Statewide	$74,136
		Contract No. 4400017092 Task Order No. 2	Collection of Existing Watershed Datasets, Models, and Studies; and Proposition of Modeling Design Approach, Schedule and Costs, Region 6	$1,577,554
	Road, Bridge	Contract No. 4400021519 S.P. No. H.012030.5 F.A.P. No. H012030	US 371: KCS RR Overpasses HBI $630,967	$630,967
WSP	Other	H.010565.5	ELEC. & MECH. ENG. ON CALL TO4	$5,001
	Other	H.972249	ELEC. & MECH. ENG. ON CALL TO5	$24,921
	Other	H.010253.5	ELEC. & MECH. ENG. ON CALL TO6	$9,888
	Other	H.010251.5	ELEC. & MECH. ENG. ON CALL TO8	$6,281
	Other	H.010253.5	ELEC. & MECH. ENG. ON CALL TO9	$87,464
	Other	H.010253.5	ELEC. & MECH. ENG. ON CALL TO10	$21,303
	Bridge	H.004791	Belle Chasse Bridge & Tunnel	$357,712
	Data Collection	H.004791	Belle Chasse Tunnel Inspection	$26,431
	Bridge	H.013284.1	MS River Bridge Toll FS	$210,785
	Other	H.003931.5	DOTD P3 Advisory Svcs On Call TO2	$616,544
Terracon	Environmental	H.004273.5	Lafayette Urban Section (I-49 Lafayette Connector) Phase II ESA, Lafayette Parish	$42,228
	Geotechnical	H.005967	Nelson Road Extension and Bridge	$51,782
	Geotechnical	H.012235.5	I-49 & Verot School Road	$53,890
	Geotechnical	H.005121	LA 1 to LA 415	$227,217
	Geotechnical	H.012569	Little Sugar Creek Bridge	$4,423
	Geotechnical	H.000385.5	US190:LA415 & RR Overpass	$213,763
	Geotechnical	H.003931	I-10 Lake Charles	$743453

Firm(s)	Past Performance Evaluation Discipline(s) *	State project number	Project name	Remaining Unpaid Balance**
	Geotechnical	H.011670	Loyola Interchange Design-Build	$388,732
Forte & Tablada	Bridge	H.012485.1	IDIQ Contract 4400010099, Task Order No. 4 Off System Bridge Load Rating, Statewide	$111,108
	Bridge	H.012485.1	IDIQ Contract 4400010099, Task Order No. 5 Bridge and Culvert Load testing	$334,784
	Survey	H.014628.5	IDIQ Contract 4400010587, Task Order No. 17 Turn Lanes at Rice Mill	$0
	Survey	H.014219, H.014222, H.014228, H.014231, H.014236	Rural Bridge Replacement Initiative, Phase II	$564,532
	Survey	H.013954, H.013979, H.013985, H.013992, H.013994, H.013995, H.013990	Rural Bridge Replacement Initiative, Phase I	$107,791
	Bridge	H.010017.5	US 907 Westbank Expressway	$13,679
	Survey	H.003931.5	IDIQ Contract 443015237 I-10 Calcasieu River Bridge Replacement	$1,250,000
	Survey	H.004273.5	DOTD I-49 Connector (Lafayette Regional Airport to I-10/US 167 Interchange)	$241,833

20. CERTIFICATIONS/LICENSES – N/A

21. QA/QC PLAN AND/OR WORK PLAN – N/A

22. SUBCONSULTANT INFORMATION

Firm Name (as registered with Louisiana's Secretary of State)	Address	Point of Contact and email address	Phone Number
WSP	One American Place 301 Main St., Suite 2200 Baton Rouge, LA 70801	Max Nassar, Vice President Max.Nassar@wsp.com	(225) 218-3584
Terracon	2822 O'Neal Lane, Building B Baton Rouge, LA 70816	Lynne Roussel, PE Lynne.Roussel@terracon.com	225-344-6053 225-239-2632 (Direct)
Forte & Tablada	9107 Interline Avenue Baton Rouge, LA 70809	Brad Holleman bholleman@forteandtablada.com	225-927-9321

23. LOCATION – N/A

MICHAEL BAKER TEAM PERSONNEL

PRINCIPAL-IN-CHARGE
Daniel Thornhill, PE **MPR 1, 2**

H&H
Mohamed Bagha, PE, CFM, PMP **MPR 6a**

DAM ANALYSIS AND DESIGN
Joe Kudritz, PE

PROJECT MANAGER
Jade Rung, PE, PMP **MPR 2**

H&H
Yingjian "Jim" Han, PE, CFM **MPR 4**

DAM ANALYSIS AND DESIGN
Brian Afek, PE

DEPUTY PROJECT MANAGER, DAM ANALYSIS AND DESIGN
Jared Deible, PE **MPR 3**

H&H
Craig Wenger, PE, AICP, CFM **MPR 6b, c**

DAM ANALYSIS AND DESIGN
Ed Kaminski, PE

QA/QC MANAGER
Steve Kramer, PE

H&H
Sahas Shrestha, PE, CFM

ENVIRONMENTAL
Christopher "Chris" Gesing, PE

GEOTECHNICAL
Don Green, PE

H&H
Don Gregor, PE

ENVIRONMENTAL
TJ Holliday, PWS

GEOTECHNICAL
Gang Zuo, PhD, PE

DAM ANALYSIS AND DESIGN
Chris Tagert, PE, CFM **MPR 6d**

SURVEY & MAPPING SUPPORT
Stephen Clancy, PLS, PSM, GISP
MPR 5

GEOTECHNICAL
John Lasko, PG

DAM ANALYSIS AND DESIGN
Mujahid Chandoo, PE

CONSTRUCTION INSPECTION SERVICES
Mary Flynn, PE

MICHAEL BAKER TEAM PERSONNEL

CONSTRUCTION INSPECTION SERVICES
Jason Mashell, PE

GEOTECHNICAL
Steve Greaber, PE[3]

GEOTECHNICAL
Lynne Roussel, PE[3]

GEOTECHNICAL
Matt Minton[3]

GEOTECHNICAL
Brian Alexander[3]

H&H
Ahintha Kandamby, PhD. PE[1] **MPR 6b, c**

H&H
Tom Edwards, PE[1] **MPR 6b, c**

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ENVIRONMENTAL
Rachel Keane[3]

ENVIRONMENTAL
Rebecca Gaspard[3]

SURVEY & MAPPING SUPPORT
Brad Holleman, PLS, EI[2] **MPR 5**

SURVEY & MAPPING SUPPORT
Ross Wilson, PLS[2] **MPR 5**

SURVEY & MAPPING SUPPORT
Brent Campbell[2]

SURVEY & MAPPING SUPPORT
Jace Ricard, PLS[2]

SURVEY & MAPPING SUPPORT
Spencer Rimes

QA/QC SUPPORT
Gregg Hudock, PE[1]

SUBCONSULTANT PARTNER FIRMS

WSP[1]
Forte & Tablada[2]
Terracon[3]