NOTICE OF MEETING

CITY OF BRANSON

CAPITAL IMPROVEMENT COMMITTEE

Committee Meeting – Thursday, April 7, 2016 – 8:30 a.m.
Municipal Court Room – Branson City Hall – 110 W. Maddux

AGENDA

1) Call to Order.

2) Roll Call.

3) Discussion of Consultant Selection Compton WWTP Flood Protection Study. [Consultant Selection] [Alfred Benesch] [Allgeier, Martin & Associates] [Black & Veatch] [Burns & McDonnell] [HDR] [Horner & Shifrin] [Jacobs] [Olsson Associates] [Reintz & Jens] [TranSystems] [V&K]

4) Update on Project Status.

5) Update on Change Order.

6) Adjourn.

To: Capital Improvements Committee

FROM: Matt Filice, Assistant City Engineer

DATE: April 1, 2016

SUBJ: Engineer Selection for the Compton Wastewater Treatment Plant Flood Protection Study

The Compton Wastewater Treatment plant was built in the 1980's. At that time, a berm/levee was constructed around the plant site to protect the plant in the event of a major 100-year flood event. If the plant was ever flooded there would be enormous problems and expenses because much of the electronics, pumps and controls would be destroyed and would take months to reconstruct, but even more concerning would be the fact that the wastewater could not be treated. During the time period the plant was being repaired, raw sewage would be flowing into Lake Taneycomo, which would be an environmental nightmare and probably result in major media attention and negative impacts on tourism.

Since the time the berm was constructed several changes have occurred: (1) the plant capacity has been expanded 100% and now has a capacity of 5.1 million gallons per day (2) The Corps of Engineers and FEMA have revised their flood elevation data and the berms are no longer calculated to be above the 100-year flood level (3) climate change has resulted in more frequent large flooding events with future increases predicted and (4) social media has been invented and negative publicity can now spread quickly world-wide. During the December 2015 flood event, the lake level was less than one foot away from overtopping the berm. It is obvious that something must be done to better protect the plant and be more resilient to climate change. This project is intended to develop the best solution to make the plant more resilient.

The Request for Proposals (RFP) was sent to all firms on file with the city that listed similar experience in their qualifications. The RFP was structured for a study and analysis to be completed as a first step in the project. The subsequent steps would be to have the selected firm prepare the construction plans and after that the project would be advertised for bid, with contractors selected based on lowest and best price. For the engineer selection, this process follows Branson's standard procedure to select a firm based on qualifications and then city staff negotiates a contract price. Proposals were received from ten design firms as follows:

These 10 firms submitted proposals:

Black & Veatch	Trans Systems
HDR	Burns and McDonald
Olsson Associates	Reitz & Jens / CMT / PPI
Horner & Shifrin	Veenstra & Kimm
Jacobs	Allgeier/Martin / Palmerton & Parrish

The criteria used to evaluate the options were (in order of importance):

Indicates knowledge of project - High

Relevant experience - High

Previous experience - High

Qualified staff - High

Detailed discussion of issues and approach - High

Visit site - Medium

Addressed Funding - Low

Innovative Ideas - Low

Interim Protection - Low

The selection was evaluated by means of a decision table.

	Indicates knowledge of project	Relevant experience	Previous experience	Qualified staff	Detailed discussion of issues and approach	Visit site	Addressed Funding	Innovative Ideas	Interim Protection	Summary
Black and Veach	Excellent	Excellent	Excellent	Good	Excellent	Good	Good	Good	Good	8.28
HDR	Excellent	Excellent	Excellent	Good	Good	Good	Good	Good	Good	7.95
Olsson Assoc.	Excellent	Excellent	Excellent	Good	Good	Good	Good	Good	Good	7.76
Allgeier, Martin / Palmerton and Parrish	Excellent	Excellent	Excellent	Good	Good	Good	Fair	Good	Good	7.74
Horner and Shifrin	Excellent	Excellent	Excellent	Good	Good	Good	Fair	Good	Good	7.74
Jacobs	Excellent	Excellent	Excellent	Good	Good	Good	Good	Good	Good	7.72
Trans Systems	Excellent	Excellent	Excellent	Good	Good	Good	Good	Good	Good	7.40
Burns and McDonald	Excellent	Excellent	Excellent	Good	Good	Good	Good	Good	Good	7.32
Reitz and Jens / CMT / PPI	Good	Excellent	Excellent	Good	Good	Good	Fair	Good	Good	7.04
Veenstra and Kimm	Fair	Fair	Good	Fair	Good	Good	Fair	Good	Good	5.15

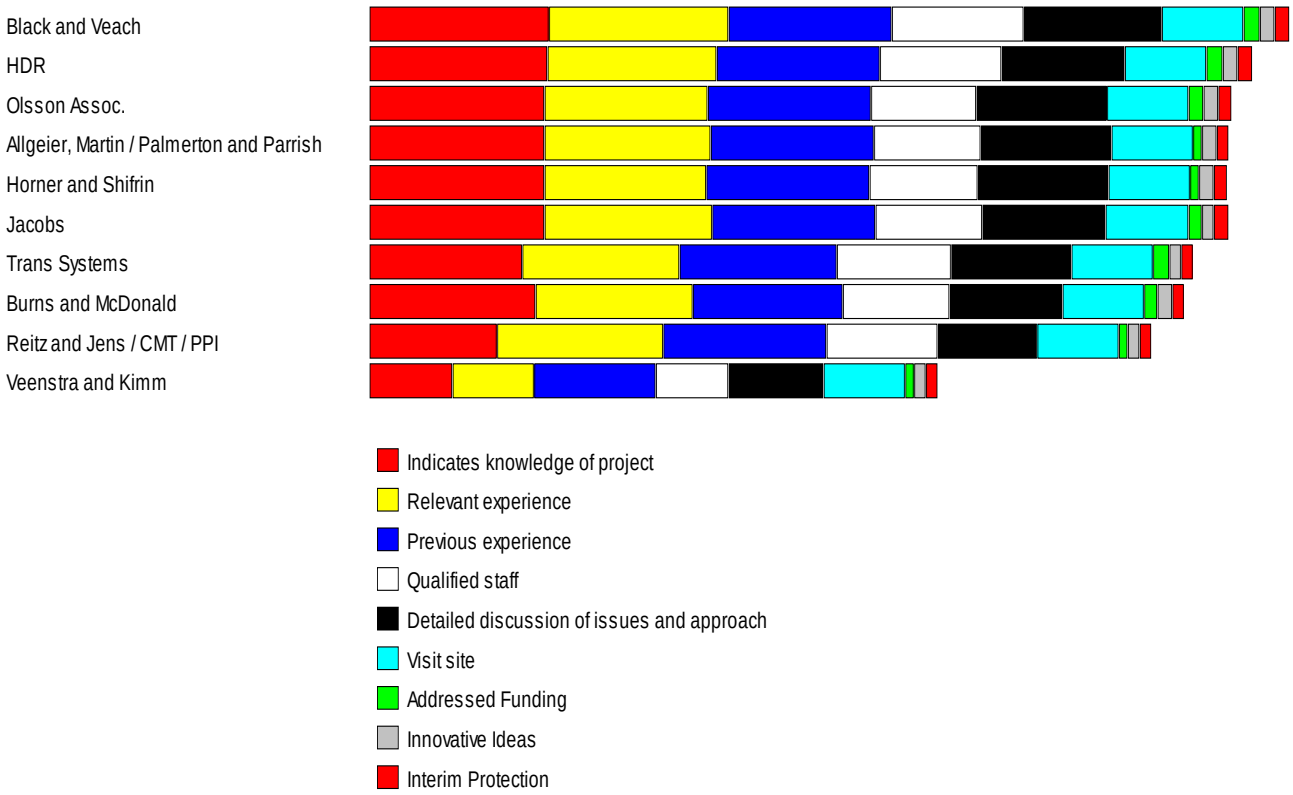
Alternative choices considered are listed down the left side of the table. The criteria used to evaluate the various options are listed along the top. Initially entered in no particular order, both the choices and the criteria were then repositioned according to importance of criteria and effectiveness of individual choices in meeting them.

As criteria are evaluated and weights assigned according to which factors are considered to be most significant, the factors are sorted from left to right in order of importance (i.e., the factor considered by the decision maker to be most significant in meeting overall needs ends up in the left-most position).

Similarly, as choices are evaluated according to effectiveness in meeting criteria, the best choices migrate to the top of the list. When the process is complete, the best choice should emerge at the top.

As selection alternatives and the criteria to be used in evaluating them are entered into the table, weights are assigned to each of the evaluation factors so that they are ranked in order of their importance in fulfilling the overall task.

Relative strengths of the various choices in each of the factors is illustrated in the following graph:



Staff would recommend any of the top four rated firms be seriously considered for this project. All could do an excellent job and provide the needed results.

In the past, the Capital Improvements Committee has found it helpful to understand some of the thought processes that staff used during the proposal reviews. The following information is provided on this process for the firms. This is not intended to influence the committee's decision and individual reviews, but simply to provide some additional information.

As the proposals were reviewed, if the firm discussed, or at least mentioned, any issues or topics that pertain to the proposed project, it was assumed to show they were interested in the project enough to make some effort to familiarize themselves with the details. That interest in the project is anticipated to relate directly to the firm's enthusiasm to do the design work and thereby produce a better outcome for the city. If a proposal had little detail it is more likely simply a

"cookbook" proposal that is a generic format the firm may use for multiple projects. A generic proposal takes much less effort and could mean less willingness to excel in the design process.

Black & Veatch: Black and Veatch's proposal was well written and very detailed. They have worked on an extensive number of projects, several of which were high profile, similar to the Compton Wastewater Treatment Plant project. The firm has an extensive number of highly-qualified staff, which would be an advantage for peer review. Black and Veatch is currently working on the Cooper Creek Wastewater Treatment Plant plant and we have been impressed with their knowledge and performance.

HDR: The proposal from HDR was also well written and well detailed. The technical approach outlined in HDR's proposal was very impressive. HDR appears to be well experienced with projects similar in scope to the Compton Wastewater Treatment Plant project. HDR is also a large firm with an extensive number of qualified staff. HDR recently completed the Cooper Creek biosolids facility, which was a very complex project.

Olsson Associates: Olsson Associates submitted a proposal that was well written and successfully addressed the issues outlined in the proposal. Olsson appears to have adequate technical staff and similar project experience to successfully perform this work. Olsson Associates designed the 2009 peak flow improvements for the Compton Wastewater Treatment Plant.

Allgeier/Martin & Palmerton & Parrish: Allgeier, Martin & Palmerton & Parrish is a project team assembled to combine the two firms' areas of expertise. Allgeier/Martin has a large presence in the Southwest Missouri region while Palmerton & Parrish has performed an extensive amount of work in the Branson area. Both firms are technically well respected and appear capable of performing the work.

CITY OF BRANSON
Engineering/Public Works Department

110 West Maddux St., Suite 310 • Branson, Missouri 65616
(417) 337-8559 • Fax (417) 337-8181

January 9, 2016

Steve Roth
Senior Project Manager
Alfred Benesch & Company
11010 Haskell Avenue, Ste #200
Kansas City, KS 66019

Re: Request for Proposals – Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Roth,

The City of Branson is requesting proposals for an engineering study of flood protection alternatives for the existing Compton Wastewater treatment plant located in Branson, Missouri. The plant is located along Lake Tanycomo and is currently protected by a levee system constructed in the 1970's. The White River basin has recently been repeatedly impacted by record amounts of precipitation resulting in unprecedented flood releases from Table Rock Dam. Those releases, in turn, have caused record lake levels in Lake Tanycomo resulting in floodwater approaching the top of the existing levee and groundwater seepage within the plant. The top of levee elevations are currently significantly below the FEMA 100-year water surface. In addition to the levees not meeting current FEMA flood plain criteria, the City is concerned about the increased risk of more frequent and intense rainfall caused by global warming/climate change. The intent of the study is to provide recommendations for the protection to the plant to meet current flood standards in order to reduce the risk of inundation to an acceptable level.

Study and Alternatives Analysis

The City has identified a number of issues that will need to be addressed by the study. Those issues are as follows:

1. The consultant shall determine the recommended design criteria for flood protection. Considerations will include FEMA 100 or 500 year floodplain and maximum probable release at Table Rock Dam. The United States Army Corps of Engineers White River Water Control Plan may be a controlling document.

2. From the design concept to construction, this project may take considerable time (years) to complete. The consultant shall address the need for interim flood protection recommendations, i.e. partially raised levee, stockpile sandbags or other flood protection devices.

3. The consultant shall determine the scope of protection; plant only, or include other nearby city facilities such as the recycling center and public works shops. The main driver for other than plant protection will probably be economic.

4. The consultant shall determine the impact of any recommended flood protection improvements on adjacent and upstream properties and any mitigations that would be required.

5. The influent pump station pumping system is currently "flood protected" to the FEMA 100 year water surface. The consultant shall determine if flood protection is to be installed in that area to protect other facilities around the influent pump station including the old control building. One possible option may be to enhance protection for only those facilities essential to the operation of the treatment plant. A decision will probably require an economic analysis.

6. The consultant shall determine if the pumping system designated to remove rising groundwater would be permanent or portable. A groundwater transmissibility study will be required to evaluate the maximum probable groundwater flow in order to determine required pump capacity.

7. The consultant shall address the operation of the groundwater check valves in the clarifiers, waste sludge tanks, holding tanks and aeration basins during and after the flood event.

8. The consultant shall address raising the Compton Drive roadway to the required flood protection elevation for access to the treatment plant during flood events. Issues to be addressed would include determining a configuration of grade transitions to existing ground elevations and the impacts of a "raised" Compton Drive on flowing floodwaters.

9. The consultant shall address the adequacy of the effluent pump capacity at the maximum flooded lake level. Effluent pumps may need an alternative solid pipe discharge to move effluent flow outside of the contained area if lake level exceeds the top elevation of the effluent post aerator structure. Adequate protection against backflow into the existing facility gravity flow discharge pipe would need to be determined.

10. The consultant shall investigate the need and options for a subsurface seepage cutoff. Consultant shall investigate the required depth for the cutoff and any possible conflicts with subsurface plant utilities.

11. The consultant shall address any potential vibration or other impacts on the plant due to cutoff installation. Apparently there were difficulties trying to dewater the site when the original plant construction was done in the 1980's and those dewatering efforts resulted in problems with the ground settling. The major plant facilities are now supported on piers to bedrock.

12. The consultant shall investigate possible state and federal funding sources and shall prepare any required applicable funding applications.

It is expected the study will provide various alternatives for interim and permanent flood protection with respective estimated construction costs. Upon completion, the study will be the basis of design phase engineering to develop construction documents that will be prepared for bidding and construction. The City, at its option, will either negotiate the design fee with the study consultant or issue a separate Request for Proposals.

A map is provided which depicts the general layout of the facility.

The City has digital aerial photography and a 2-foot topographical data layer of this area in its Arc Info based GIS system. This data can be exported to the consultant in an AutoCAD DXF format for use in the preliminary design work. A field survey will be required to determine precise locations of existing facilities as well as existing facility elevations.

Future Design Services Phase (Not Part of this Scope)

The consultant selected for the project will be responsible for all surveying, calculations, preliminary drawings, final construction drawings, cost estimates, specifications and the necessary steps to advertise, bid and award the construction contract. The City will provide the "front-end" documents, prevailing wage rates, and "general provisions" to be incorporated into the contract. The consultant will prepare the special conditions and the technical specifications to be incorporated, along with the City-provided information, into the contract documents. The consultant will provide the City a PDF file of the plans and a PDF file of the specifications for posting on the City's website. The consultant will be available to answer questions from the contractors during the bidding phase and act as the source for plans and specifications to the bidders.

All work to be performed to upgrade this facility shall not interrupt the operation of the wastewater treatment plant or its related wastewater conveyance facilities. The design work should also include the development of specifications and provisions that will require that, prior to the start of construction, the contractor shall submit a plan to the city that addresses the methodology of maintaining plant operation as the contractor is constructing various elements of the flood protection improvements. If any utility in the project area will be impacted by the construction, the design plans will need to include relocation plans.

Future Construction Services Phase (Not Part of this Scope)

Once the project is under construction, City staff will handle the daily contract administration, inspection and pay requests from the contractor. The consultant will be expected to be available to answer questions, approve shop drawings (as required), meet should unanticipated problems arise and lend technical support throughout the project, including during equipment startup and testing, until accepted by the City. At the completion of the project, the consultant will conduct a field review of all work completed

by the contractor. At that time, the consultant will advise the City if the project was built in substantial conformance to the construction documents as well as the design intent of the consultant.

Upon completion of the project, the consultant will provide as-constructed plans in PDF format to the City.

Proposal Submittal

In accordance with City of Branson Ordinances, the proposal submitted by your consulting firm must contain certain minimum information:

- Your firm's history of completing related projects on time and at/under budget, the name, number and qualifications of individuals of the firm and the geographic location of principal offices.
- The proposed schedule for the completion of the project by your firm.
- A general discussion of how the project is to be completed or conducted.
- Detailed description of Quality Assurance/Quality Control procedures to be utilized on this project.
- Detailed description of value engineering procedures to be utilized during design of the facility.
- Any other information that your firm feels is deemed to be relevant to the project.

The city of Branson recognizes that design firms in private practice must expend significant time and resources to respond to an RFP of this nature. Therefore, since the city of Branson already has each firm's qualifications on file for review, the city is setting a maximum proposal size for this RFP. All firms responding to this RFP shall limit their proposal submittal to a maximum of fifteen (15) single sided 8.5" x 11" sheets. This includes any graphics, exhibits or attachments. The city's selection committee will be aware of this size limitation. Relevant project descriptions should not exceed 2 pages and individual resumes should also not exceed 2 pages.

The City of Branson's policies stipulate that the proposals be uploaded to the city's web site for use by the selection committee. Therefore, any confidential or proprietary information should not be included in the proposals.

If your firm is interested in submitting a proposal, we request that one (1) print copy of your sealed proposal and a PDF file on CD be submitted to the City of Branson by Friday, March 11, 2016 to the attention of David H. Miller, P.E., City Engineer, City of Branson, 110 W. Maddux, Suite 310, Branson, MO 65616. At that time, city staff will evaluate all proposals received and make recommendations to the Board of Alderman Capital Improvements Committee. That committee will review the staff's evaluation of the submitted proposals and, if a firm is not selected at that point, they may prepare a short list of firms to be interviewed and then, at its option, invite those organizations to appear at a designated time and place for an oral presentation/interview. The city reserves the right to select one or more organizations for interviews that appear best qualified to provide

the services desired. The city review committee's recommendation is not binding on the city. After selecting a firm, the committee will make a final presentation to the Board of Alderman at their next regularly scheduled meeting. The design contracts will then be prepared and executed. If the city is unable to negotiate a satisfactory contract with the selected firm, negotiations with that firm shall be terminated and the city shall undertake negotiations with another of the qualified firms. If the city is unable to negotiate a satisfactory contract with the second firm, negotiations with that firm shall be terminated and the city will undertake negotiations with a third qualified firm.

If the city is unable to negotiate a contract with any of the selected firm(s), the city shall reevaluate the scope of services including reasonable fee requirements and again compile a list of qualified firms and proceed in accordance with the above selection procedure. The design contracts will then be prepared and executed.

The review committee and the city reserve the right to reject any/or all qualification submittals or to waive minor defects or irregularities in any submittal. The city further reserves the right, without prior notice, to supplement, amend or otherwise modify this request for qualifications or otherwise request additional information from any or all applicants.

By submitting a qualification statement, the consultant thereby agrees that the city's decision concerning any submittal in any respect is final, binding and conclusive upon it for all purposes, and acknowledges that the city, in its sole and unqualified discretion, may waive or deviate from the procedures and/or timetable outlined.

All materials submitted become the property of the city and may be available to the public. All costs incurred in connection with responding to the request for qualifications will be borne by the submitting organization.

If you have any questions, or need any clarification please do not hesitate to contact Matt Filice, Assistant City Engineer in the City of Branson Engineering Department at (417) 243-2734.

Sincerely,

David H. Miller

David H. Miller, P.E.

cc: Mike Ray, Utilities Director
Matt Filice, P.E., Assistant City Engineer

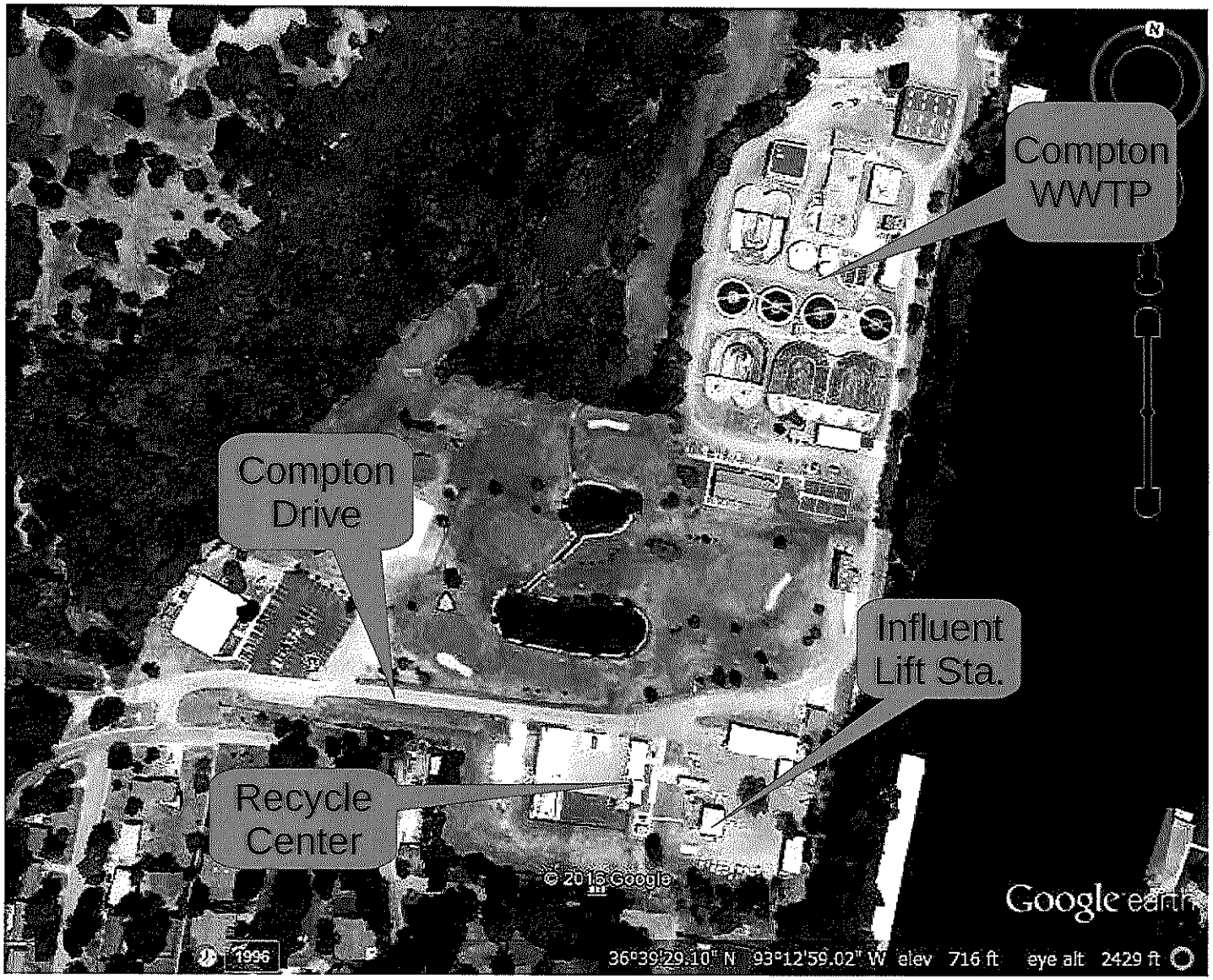


Exhibit A - Compton Wastewater Treatment Plant and Vicinity

ALLGEIER, MARTIN and ASSOCIATES, INC.
Consulting Engineers

PALMERTON & PARRISH, INC.

Request for Proposal
Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements
City of Branson, MO

March 9, 2016

Mr. David H. Miller, P.E.
City Engineer
City of Branson
110 West Maddux St. Suite 310
Branson, Missouri 65616

Re: Allgeier, Martin and Associates, Inc. and Palmerton & Parrish, Inc. Team
Statement of Qualifications for Engineering Study for the Compton Drive
Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Miller:

Allgeier, Martin and Associates, Inc. (AM) and Palmerton & Parrish, Inc. (PPI) are pleased to provide this Statement of Qualifications for completion of an Engineering Study for the City of Branson's Compton Wastewater Treatment Plant Flood Protection Improvements Project. The Team of AM and PPI provides a uniquely qualified group of local, technical subject matter experts; project managers with outstanding communication skills, and a proven record of delivering high quality and cost effective solutions to our Clients.

Allgeier Martin was founded in 1954 in Joplin, Missouri and remains headquartered there today with a total staff of 134 employees. AM specializes in Civil and Electrical Engineering, and has a large portfolio of wastewater treatment plant, hydraulic evaluation, and cost alternative analysis projects. AM's President, Mr. Dean Willis, P.E. will serve as Principal in Charge for this Project, and will oversee the project design elements and schedule. Mr. Joe Wilson, P.E., P.H. from AM's Hydro Division will serve as AM's Lead Hydraulic Engineer.

PPI was founded in 1989 in Springfield, Missouri, and established a Branson office in 1991. PPI specializes in Geotechnical Engineering, Subsurface Investigation, and Construction Materials Testing, and has unmatched geotechnical engineering project experience along Lake Taneycomo, in the City of Branson, and in Taney County. Ms. Rachel Goeke, P.E. will serve as PPI's Project Manager and Lead Geotechnical Engineer. Mr. Shane Rader, P.E. will manage PPI's field drilling and subsurface investigation activities.

AM and PPI have a long history of working together, to the extent that our Clients view us a seamless Team. AM and PPI have worked together to develop a Project Approach that is both comprehensive and reasonable. We look forward to executing our Project Approach and working with the City of Branson through the iterative process of flood protection for the Compton Drive Wastewater Treatment Plant.

ALLGEIER, MARTIN and ASSOCIATES, INC.
By:

Dean Willis, P.E.
President and Project Manager

PALMERTON & PARRISH, INC.
By:

Rachel Goeke, P.E.
Geotechnical Engineering Manager

Submitted: One (1) Bound Copy
One (1) pdf Copy on CD

Project Understanding

The Compton Drive Wastewater Treatment Plant (WWTP) is located within the floodplain of the White River, channelized as Lake Taneycomo since Table Rock Dam went into service in 1958. The primary facilities of the Compton Drive WWTP are located within a containment levee with an approximate crest elevation of 714 feet. According to FEMA records, the current mapped 100 year flood elevation at the Project Site is 719 feet.

The City of Branson has two primary objectives for the Project:

1. Provide increased flood protection for the Compton Drive WWTP
2. Be a good steward to the community by minimizing impacts to neighboring properties.

Other project objectives include:

1. Determine appropriate level of flood protection, 100 year or 500 year, for the Compton Drive WWTP, based on a comprehensive evaluation of Plant operation, cost, and impact to neighboring properties.
2. Determine if additional flood protection should be provided for the filter building, influent pump station, maintenance buildings, and recycling center, as well as the level of protection.
3. Evaluate on-going subsurface water flow and underseepage, including an evaluation of the City's current pumping practices. Determine if a subsurface seepage cutoff is necessary or appropriate.
4. Evaluate the necessity, applicability, and possible impacts of raising the elevation of Compton Drive to provide access during periods of high water.
5. Evaluate various elements of the Compton WWTP infrastructure, including the groundwater check valves, influent pump station, and effluent pump system.
6. Evaluate the necessity, applicability, and possible impacts of raising the elevation of Compton Drive to provide access during periods of high water.
7. Evaluate various elements of the Compton WWTP infrastructure, including the groundwater check valves, influent pump station, and effluent pump system.

Project Team

To help the City of Branson achieve all of its objectives for the Compton Drive Wastewater Treatment Plant Project, AM and PPI have assembled a Project Management Team that includes local experts in Wastewater Treatment Plant Design and Operation, Hydrologic and Hydraulic Analysis, Subsurface Investigation, Hydrogeologic Modeling, and Geotechnical Engineering.

ALLGEIER, MARTIN and ASSOCIATES, INC.

The firm commenced operations in Lamar, MO as a partnership, and moved to Joplin in 1956. The firm's focus has always been on Civil Engineering for municipal and private clients; and Electrical Engineering for rural electric cooperatives and municipal electrical utilities. The firm outgrew the offices at Tenth and Main Streets and moved to new offices on Range Line Road in 1965. The Range Line offices were expanded five times over the next 46 years. Mr. Allgeier sold his partnership interest in 1976, at which time the firm incorporated. In 2006 Allgeier Martin acquired a smaller firm located in Rolla, MO, that is nationally recognized for its work in hydrology and storm water systems design. The Rolla office represents Allgeier Martin's only satellite office. In 2011 a new 32,000 S.F. office building was constructed in east Joplin to accommodate the firm's 120 employees at that time.

Almost five years later we have 134 employees which includes 15 Civil Engineers, all licensed in the State of Missouri, 18 Electrical Engineers, 40 CAD Operators/Engineering Technician, 5 Registered Land Surveyors and 7 Survey Crews with the remaining staff personnel serving as Administrative or Support Staff. We have the available staff needed for your projects.

The firm has a 62 year history of serving city and municipal clients for their Civil and Electrical Engineering needs. We are proud of our reputation and unmatched experience with Wastewater Treatment Plants. Our Hydro Division personnel are experts in the fields of hydrology and hydraulics. They are involved in projects throughout the Midwest varying from routine storm sewer design to detailed hydrologic and hydraulic modeling. Our clients include private sector clients, government agencies, industrial clients, other consulting engineering firms and legal sector clients.

The Company offers the benefits of in-house surveying, right-of-way, mapping, computer services and reprographics departments. This diversity of skills allows most projects to be completed internally, thereby controlling costs and maximizing efficiency for our clients.

The Civil Division serves municipalities, government agencies, institutions, industries contractors, and private entities. As a consultant to such clients, the Civil Division provides a complete range of engineering services including water, wastewater, stormwater, transportation, and land surveying services. Our services also include structural, planning, construction administration and inspection, and right of way acquisition.

PALMERTON & PARRISH, INC.

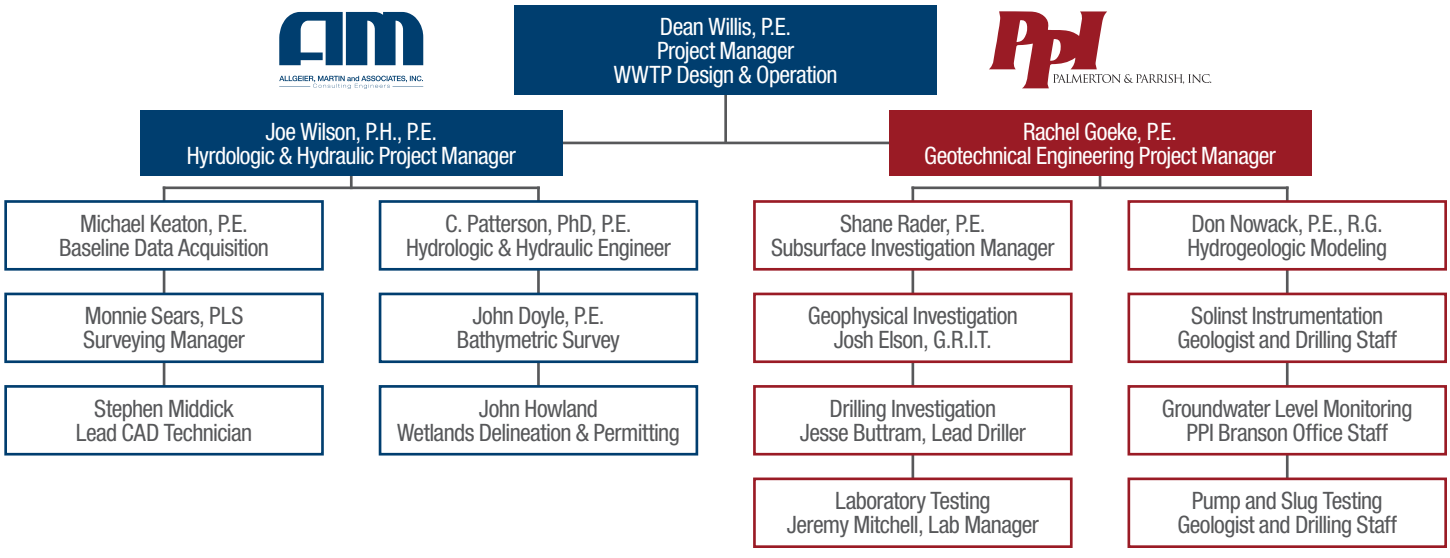
Palmerton & Parrish, Inc. (PPI) is a Consulting Engineering Firm that specializes in Geotechnical Engineering, Subsurface Drilling, Construction Materials Testing, and Environmental Services. PPI was founded in Springfield, Missouri in 1989, and is headquartered there today. PPI maintains a constant staffing level of more than 50 full-time employees, who work out of our Springfield, Missouri headquarters and branch offices in Branson, Missouri, Joplin, Missouri, and Tulsa, Oklahoma. PPI's professional staff includes 10 engineers and geologists, including five (5) geotechnical and geological engineers registered in the State of Missouri, one (1) of whom is also a Registered Geologist.

PPI has considerable experience with evaluation and design of earthen dam and levee structures, and unmatched experience with slope stability analysis along Lake Taneycomo. PPI is the longest standing Geotechnical Engineering service provided in the City of Branson and has a long portfolio of site development, slope stability analysis, retaining wall design, slope failure repair designs, and other geotechnical-related Projects in Branson, Taney County, and the surrounding area.

The pictures below show subgrade stabilization at the Branson Landing and a retaining wall designed by PPI as part of a slope failure repair project at Dogwood Canyon.

Team Organization

Key members of the Project Team are shown on the organizational chart below. Career profiles are provided in Section 5.0 of this SOQ.



RISKs Based Assessment & Value Engineering

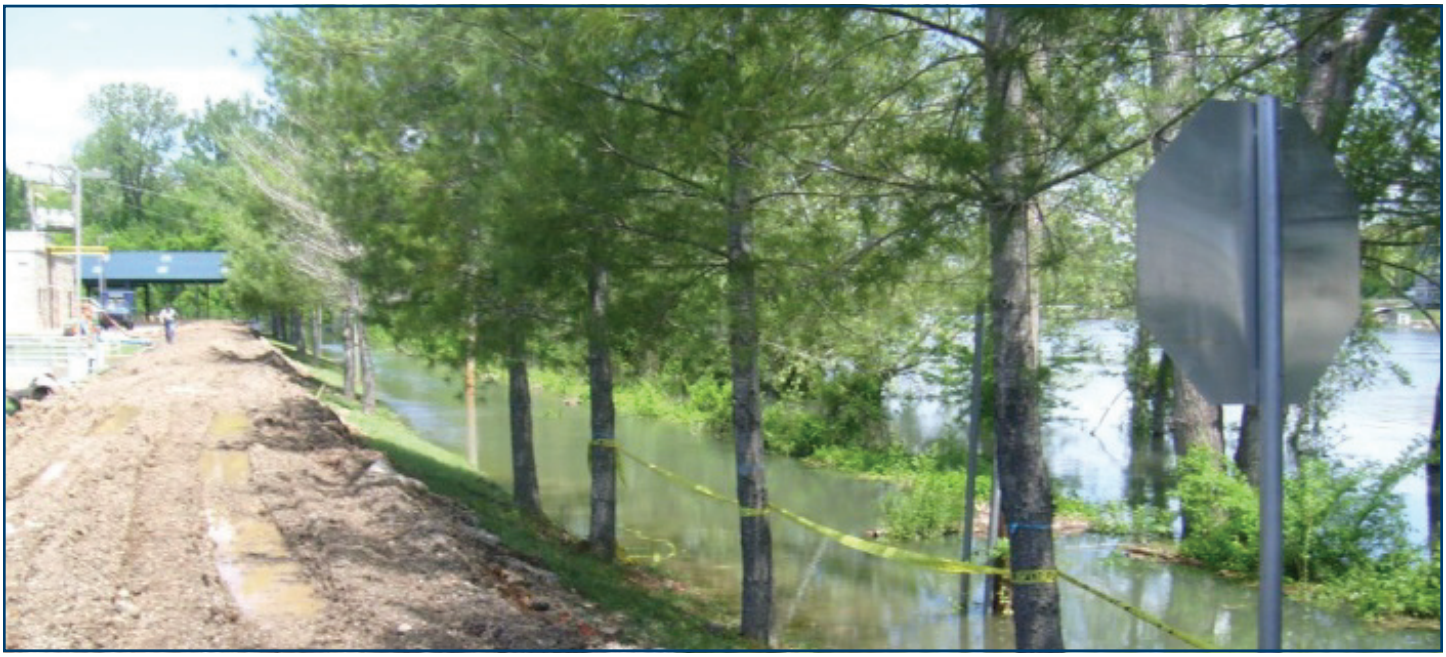
During flood events, the Compton Drive WWTP experiences two (2) primary risk factors:

1. Potential OVERTOPPING of the levee embankments, which could inundate the Plant, and possibly also lead to a levee breach if progressive scour occurred at the levee crest; and
2. Uncontrolled UNDERSEEPAGE beneath the levee embankment that could result in flooding of critical electrical components and possible inundation of the Plant.

With respect to recent weather patterns and flooding events in the vicinity of the Project Site, the AM/PPI Team believes that overtopping is the most immediate, and greatest risk, to the Plant. AM/PPI will immediately commence work on hydrologic and hydraulic studies to evaluate the impacts of raising the levee elevation to provide 100 year or even 500 year flood protection of the major facilities at the Plant, as well as ancillary facilities at the Plant.

The following photos were taken by Ms. Rachel Goeke, P.E. on April 28, 2011, after the peak of a major flood event at the Compton Drive WWTP, during which the City worked to temporarily raise the levee crest elevation. As the hydrologic and hydraulic studies are completed, the AM/PPI Team has a planned approach to analyze existing obstructed flood conditions, provide compensatory water volume storage, and delineate wetlands and procure required permits. **Our Team also has a unique, and constructible, concept for a flood wall that could be installed in the very near term to provide much needed flood protection. These concepts are discussed in greater detail in subsections 3.1 through 3.3, and 3.5.**

The AM/PPI Team believes that underseepage is a secondary concern at the Compton Drive WWTP. Complete evaluation of underseepage at the Compton WWTP is an iterative approach that will take significant time if done properly. A detailed discussion of our Team's Project Approach for underseepage evaluation is presented in Section 4.0. **Depending on the outcome of our detailed underseepage evaluation, possible concepts to mitigate underseepage impactions are discussed in Section 3.4.**

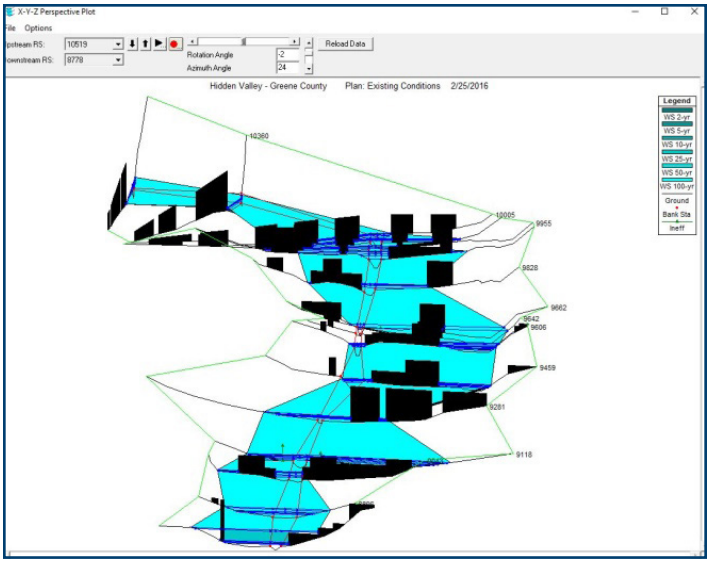


Analysis of Existing Obstructions to Flow

The picture to the right shows a hydraulic study AM completed to analyze existing **obstructed flow** conditions. The ability to complete this analysis accurately is critical for the Compton Drive WWTP Project as it pertains to the possibility of providing a **"Statement of No Rise"** for the Project.

There are significant existing obstructions within the 100 year flood plain. As the iterative design process proceeds, the Design Team may find that by providing compensatory storage volume adjacent to the site, a **"Statement of No Rise"** could be feasible for the Project.

In the event that a **"Statement of No Rise"** is not possible, the Design Team is experienced with preparation of **Letter of Map Revisions (LOMR)**, and will assist the City with that process.



Compensatory Water Storage Volume

Depending upon the outcome of AM's hydrologic and hydraulic analysis, it may be possible to provide a "Statement of No Rise" if the Project can provide compensatory water storage volume on adjacent properties. A brief review of Taney County Assessor records indicates that the City of Branson is the sole owner of a 28.62 acre parcel that encompasses the Compton Drive WWTP, the property to the west, and the golf course, as well as a 3.1 acre parcel to the south that includes a portion of the ancillary buildings for the WWTP. The Empire District Electric Company is shown as the Owner of the property immediately east of the plant, and also a property on the southwest corner of the 28.62 acre parcel. It is likely that compensatory storage volume could be provided on property already owned by the City of Branson.

Wetland Delineation and Permitting

The AM/PPI Team includes sole proprietor Mr. John Howland, who has a long career with experience with wetland delineation and permitting. Mr. Howland provided a cursory review of the National Wetland Inventory as part of this SOQ effort, and noted that the area immediately west of the Compton WWTP is mapped as "artificially flooded / inundated". On a preliminary basis, if the Project provides compensatory storage volume in this area, Mr. Howland will be able to assist in obtainment of a 404 Permit – "No Permit Required" Application.

Underseepage Cutoff Wall Concepts

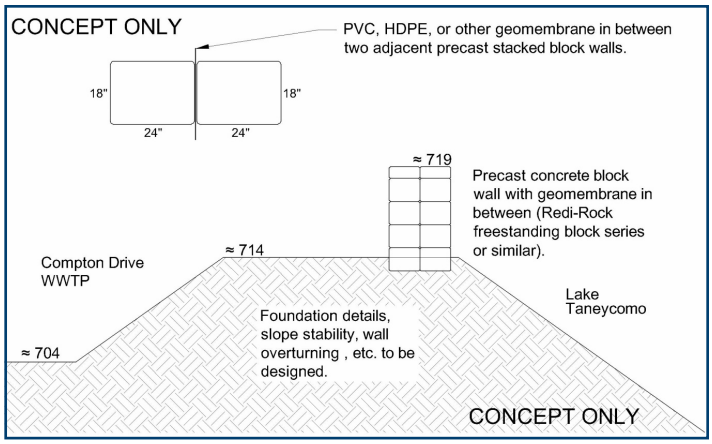
Complete evaluation of underseepage at the Project Site is critical before it can be determined if an underseepage cutoff is required, helpful, and/or cost effective. Depending on the severity of underseepage, as well as its actual and potential impacts to the operations of the Compton Drive WWTP, possible design alternates could include a sheet pile cutoff wall installed to bedrock, a foundation grouting program, or a shallow cutoff trench system with a toe drain and pumping system. Evaluation of cost versus benefit will be critical when selecting a final design approach to address any underseepage concerns identified. The AM/PPI Team believes that installation of a shallow cutoff trench, combined with a toe drain system that would allow for pumping of water that surfaces inside the Plant may be a cost effective solution for the Project.

Flood Wall Concept

The risk of overtopping the Compton Drive WWTP levee embankments is very real. The AM/PPI Team believes that construction of an above-grade flood wall can proceed immediately subsequent to completion of required hydrologic and hydraulic studies, possibly well ahead of completion of the underseepage evaluation.

Aesthetics are important in the City of Branson, as is the ability to use local contractor resources for capital improvement projects. The picture to the right shows free-standing Redi-Rock blocks used as a guard rail at the Cox Branson ambulance road expansion. The wall was a Design-Build effort by PPI, the Beck-Killian Joint Venture, and Tom Boyce Excavating.

Construction of a free-standing, precast, stacked block wall could provide a good solution that is easily constructed at significantly less cost than a deep sheet pile wall. In concept, the design could utilize two free-standing precast walls, with a geomembrane in between for additional impermeability during flood conditions. Determining the most appropriate extents of the flood wall construction would be a function of the hydraulic analysis and WWTP operations, along with total project cost.



Project Approach

Establish and Evaluate Baseline Conditions

Obtaining a good understanding of existing, baseline conditions is critical for the success of the Project. The AM/PPI Team will work with City Staff to gain an understanding of their concerns and goals for the Project. The first phase of establishing baseline conditions will be research and data collation including:

1. Review of existing design drawings
2. Meeting with City staff to discuss WWTP operating procedures
3. Collecting and organizing available data from recent and historic flood events, including elevation data, flow data, and observations of water connectivity within the WWTP

The second phase of work will be preliminary engineering analysis to determine if "what we think we know" actually makes sense. For example, preliminary hydraulic analysis will be performed using existing bathymetric survey data from the City, and the analysis output will be compared to recent observations during flood conditions. This evaluation will help the Team determine if obtainment of bathymetric survey data is necessary.

A traditional, visual levee inspection will be also be performed by PPI during this phase to identify potential performance concerns with the containment levee. PPI will carefully review the City's observations regarding water connectivity and visually inspect manholes, grate inlets, and outlet structures.

Summarize Baseline Conditions and Plan to Fill Data Gaps

The AM/PPI Team will summarize the results of the baseline condition evaluation, and identify areas where addition data is required. At this point in the study, the Team plans to develop a detailed scope of work to answer some of the questions below.

1. Does preliminary hydraulic modeling correlate with recent observations during flood events? If not, determine what additional data we need.
2. Subjectively, how big of a concern is underseepage? What are the most appropriate methods to quantify underseepage based on the current understanding?
3. What is the Team's impression about the ability to achieve a "No Net Rise" determination? What types of permitting do we anticipate?
4. Do we anticipate a slope stability concern? Do we anticipate a concern with foundation support of an above-grade flood wall? What types of studies do we need to complete to evaluate these concerns?

A meeting will be held with City personnel to review the findings of the project baseline conditions and preliminary engineering analysis. The preliminary findings and project plan to move forward will be reviewed in the context of overall City objectives for the WWTP and the surrounding neighborhoods.

Data Acquisition Phase – Surveying

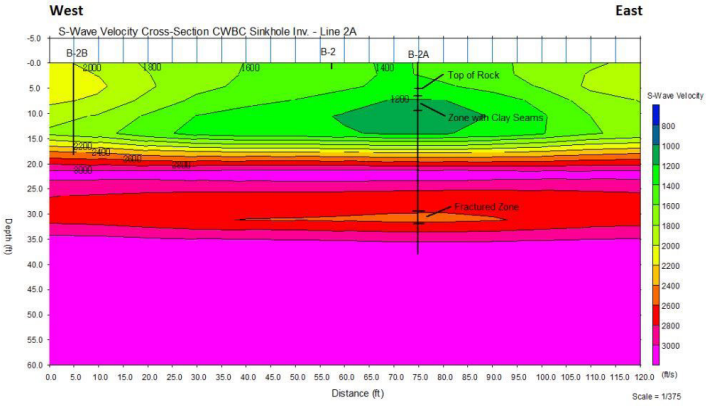
Surveying will be performed by AM under the supervision of Mr. Monnie Sears, PLS. AM will collect data necessary to supplement existing as-built documentation, including the locations of all known pipes, manholes, outlet structures, building structures including roofline elevations, and other important information identified by the engineering staff. **Our Team intends to provide the City with a comprehensive as-built drawing set for the Compton Drive WWTP that can be utilized for this Project, as well as future Projects at the WWTP.** If determined to be necessary, bathymetric survey information will also be collected at this point.

Data Acquisition Phase – Geotechnical Subsurface Investigation

The Geotechnical Subsurface Investigation will be a multi-phase study. PPI will evaluate data during the field work, and will periodically de-mobilize to complete detailed data evaluation and determine the most appropriate next steps for field data collection. **PPI has the major advantage of having a local drilling yard, and being able to proceed with iterative data collection without incurring large demobilization and remobilization costs.**

The first step in the Geotechnical Subsurface Investigation will be completion of a geophysical survey of the perimeter levee embankment. A combination of multi-channel analysis of surface waves (MASW) and seismic refraction geophysical survey methods will be utilized to characterize the condition of the subsurface conditions beneath the perimeter containment levee. Geophysical survey data will provide information regarding shear wave velocity, including extremely soft zones, indications of highly pinnacled bedrock, and indications of large voids if present. The picture below shows a MASW Survey Profile from a sinkhole evaluation project in Springfield, along with a confirmatory boring stick log.

Data from the geophysical survey will be utilized to select apparent "worst case locations" for subsurface drilling. **PPI will select subsurface boring locations to collect data for completion of levee slope stability and underseepage analysis. Selected boring locations will be converted to piezometers upon completion of drilling, and the remaining borings will be backfilled with high solids bentonite grout.** Collected soils samples will be tested for determination of in situ moisture content, soil classification, density, and soil shear strength parameters. PPI will utilize the high-end testing capabilities of our USACE and AASHTO accredited Springfield laboratory to determine drained and undrained soil shear strength parameters.



Underseepage Analysis and Additional Data Acquisition

The first step in underseepage analysis will be gaining a complete understanding and inventory of existing wells, riser pipes, manholes, drains, and historic observations at the Compton Drive WWTP. The second phase will be installation and monitoring of piezometers. At this point, PPI anticipates installation of three (3) piezometers at each of four (4) critical cross sections, with piezometers installed at the interior levee toe, interior levee crest, and exterior levee crest. Piezometers will be instrumented with leveloggers from Solinst. Groundwater level data will be automatically recorded and periodically downloaded by PPI's Branson Office staff. Data will be collated and reviewed along with Lake Taneycomo Water elevations.

The Project Team will evaluate the data from the piezometer groundwater monitoring, and determine if additional piezometer installation is necessary to further evaluate underseepage, hydraulic conductivity, and transmissivity. For the purposes of developing preliminary scope, PPI assumes that installation of an additional two (2) piezometers and one (1) larger diameter well will be appropriate at each cross section location. The third phase of underseepage evaluation would be based upon the results of slug testing performed in each well, and pump testing performed in the larger well at each cross section location. Collected data would be utilized to develop a hydrogeologic model, and evaluate the need for a shallow or deep underseepage cutoff for the Project.

The picture below is from the Lower Wood River Levee District in Madison County, Illinois, where PPI has worked for the St. Louis District USACE on a multi-year underseepage evaluation and data collection effort for cutoff wall design along the Mississippi River.

Detailed Hydraulic Analysis

As Professional Hydrologists, AM understands that there is statistical risk of recurrence, and there is actual and perceived risk based on recent weather patterns. In addition to reviewing published hydrologic data, AM will study recent regional and flash flood events in the White River Basin. AM will utilize Water surface profile analysis - U.S. Army Corps of Engineers, HEC-RAS Software and Statistical analysis of flow data - U.S. Army Corps of Engineers , HEC-SSP Software.

AM's hydraulic studies will start with the City's primary goal: providing a minimum of 100 year flood protection for the main Compton Drive WWTP facilities. Iteratively, AM will evaluate the effects of providing 500 year flood protection for the Compton WWTP facilities, and then expand the hydraulic analysis to encompass 100 year and 500 year flood protection of adjacent facilities including the influent intake building, maintenance buildings, and recycling center.

Existing FEMA Letters of Map Amendment and Revision will be reviewed to determine if the impacts of the proposed improvements will change the flood insurance status for neighboring properties.

AM will also study the possible impacts of raising Compton Drive to provide vehicular access to the Plant during flood events. **On a preliminary basis, AM believes that increased flood protection of the Plant and its anciliary facilities may be practical, but the effects of raising the entire roadway embankment for Compton Drive may result in prohibitive impacts to neighboring properties.**

Project Summary

A summary project report will be prepared detailing the project analysis, supporting data, and recommended improvements for final design. Future project phases and tasks required to meet the City's long-term project goals will be identified.

Personnel Qualifications

DEAN WILLIS, P.E.

President, Civil Engineer | Dean.Willis@amce.com

Education

- **Master of Science, Sanitary Engineering**
  Iowa State University, 1976
- **Bachelor of Science, Civil Engineering**
  Iowa State University, 1974

History

- **Allgeier, Martin and Associates, Inc.**
  1976 - Present
- **Engineering Research Institute, Iowa State University**
  1993-1996

Registrations

- **Professional Engineer**
  Missouri, Kansas, Oklahoma, Arkansas

Memberships

- **National Society of Professional Engineers**
- **Water Environment Federation**
- **American Waterworks Association**
- **Missouri Water & Sewerage Conference**

Summary of Professional Experience

Dean Willis is the President of Allgeier, Martin, and is the Director of the Civil Division and our Senior Wastewater Engineer, specializing in management of major sanitary engineering projects, water supply, treatment, and storage and distribution systems. His engineering responsibilities include preparation of studies, cost estimates, O & M manuals, liaison with federal and state regulatory agencies, and design of major water and wastewater systems.

Prior to employment at Allgeier, Martin, Mr. Willis was involved with the Engineering Research Institute at Iowa State University, Ames (1974-1976), where he obtained his masters degree in Sanitary Engineering.

JOSEPH P. WILSON, P.E., P.H.

Vice President, Civil Engineer, Hydrologist | joe.wilson@amce.com

Education

- **Master of Science, Civil Engineering**
  University of Missouri - Rolla, 1992
- **Bachelor of Science, Cum Laude, Civil Engineering**
  University of Missouri - Rolla, 1986

History

- **Allgeier, Martin and Associates, Inc.**
  2006 - Present
- **Wilson Hydro, LLC**
  1993 - 2006
- **Scott Consulting Engineers**
  1987 - 1993

Boards/Review Panels

- **FEMA - Scientific Resolution Panel**

Registrations

- **Professional Engineer**
  Missouri, Oklahoma, Iowa, Kansas
- **Professional Hydrologist**
  American Institute of Hydrology

Memberships

- **American Institute of Hydrology**
- **Missouri Society of Professional Engineers**
- **Consulting Engineers Council, Missouri**
- **American Society of Civil Engineers**
- **Chi Epsilon, Civil Engineering Honor Society**

Summary of Professional Experience

Mr. Wilson serves as our Hydro Division Manager in our Rolla, Missouri office and has extensive experience in the fields of Hydrology and Hydraulics. He is one of only eight Certified Professional Hydrologists' in the State of Missouri.

Prior to joining the firm in August 2006, Mr. Wilson was the Managing Member of Wilson Hydro, LLC, in Rolla (August 1993 to August 2006), a private consulting firm specializing in stormwater management, flood studies, bridge hydraulics, stormwater master planning, stormwater management regulation development, dam and spillway design, technical training and peer review.

Mr. Wilson was a Teaching Fellow for the University of Missouri - Rolla from 1993 to 1996 teaching undergraduate Fluid Mechanics and Engineering Hydrology and also taught Water Resources Engineering in 2007 and 2008 at Missouri University of Science and Technology. From 1987 to 1993, Mr. Wilson served as Director of Storm Water Management for Scott Consulting Engineers in Springfield, MO.

RACHEL GOEKE, P.E.

Ms. Rachel Goeke, P.E. will serve as the Geotechnical Project Manager for the Compton WWTP Engineering Study. Ms. Goeke's qualifications and work experience include a Master's Degree in Civil Engineering with an emphasis in Geotechnical Engineering, over 13 years of work experience in the Geotechnical Engineering Consulting Industry, and extensive specific project experience with levee and dam analysis, design, and construction.

Ms. Goeke's community involvement includes participation on the City of Branson's MS4 Task Force Committee in 2012 and the City of Springfield's Storm Water Crteria Manual Review Committee in 2016. Ms. Goeke is a Branson, Missouri native with a passion for preserving the natural beauty of the region while supporting development and economic prosperity.

Specific project experience includes:

- Levee Evaluation studies for the Empire District Electric Company at the Riverton Power Station and Asbury Power Plant and for City Utilities of Springfield at the John Twitty Energy Center in Springfield, Missouri;
- Lake Pawhuska Dam Evaluation, including a two phase study and recommendations for dam modification in Pawhuska, Oklahoma;
- Lake Huggins Lake Dam Evaluation, Design Modification, and Construction Phase Services, including a dam enlargement, toe drain system, and spillway modification;
- Fellows Lake Dam Spillway Evaluation, Design, and Repair Construction, including an underseepage evaluation, and design of a trench drain and cutoff wall system;
- Evaluation of the Short Creek #1 Lift Station for the Taney County Regional Sewer District, resulting in recommendations to raise the elevations of critical components and leave the Lift Station in service at its current location;
- Emergency response, geotechnical engineering evaluation, and recommendations for repair design for numerous slope failures along Lake Taneycomo subsequent to the floods of 2008, 2011, and 2015.

BRAD R. PARRISH, P.E.

President

Mr. Parrish, P.E. has over 37 years of experience in the Geotechnical Engineering Consulting and Construction Materials Testing Industry. Mr. Parrish co-founded Palmerton & Parrish, Inc. (PPI) with Mr. Fred Palmerton, P.E. in 1989, and has served as Company President since 2004. Mr. Parrish is recognized as a Local and Regional Leader in Subsurface Investigation, Shallow and Deep Foundation Design, Site Development, Slope Stability, Sinkhole and Mine Feature Remediation, and Construction Materials Testing.

Under Mr. Parrish's leadership, PPI has grown to a full time staff of around 55 employees. PPI's staff resources include a professional engineering and geologist staff of 12, a full-time drilling staff of 15, and a construction materials testing staff of 25 to 30 employees. PPI's drilling resources include ten (10) drill rigs and extensive drill tooling and equipment suited for subsurface explorations in a wide range of geologic settings.

Specific project experience includes:

- Branson Landing – HCW, LLC – Branson, MO
- Tanger Outlet Center – Branson, MO
- Shoppes at Branson Hills – Branson, MO
- Dogwood Canyon – General Store and Mill – Lampe, MO
- Big Cedar Conference Center – Ridgedale, MO
- CoxHealth Systems; Springfield and Branson, MO
- St. Louis District United States Army Corps of Engineers (USACE), On-Call Subsurface Exploration IDIQ Contracts
- Downstream Casino Resort; Quapaw, OK
- Kansas Department of Transportation (KDOT) – On-Call Geotechnical Services Contracts:
- Irving Elementary School – Joplin, MO
- Zora and Main Intersection Improvement – Joplin, MO

SHANE RADER, P.E.

Mr. Shane Rader, P.E. will serve as the Subsurface Investigation Manager for the Compton WWTP Engineering Study. Mr. Rader has been with PPI since 2002 and has served as PPI's Drilling Services Manager since 2005. Mr. Rader has managed thousands of field subsurface investigations, and is a local and regional expert with development of subsurface investigation programs, subsurface drilling methods, interpretation of subsurface data and geologic conditions, and development of pertinent geotechnical engineering recommendations.

Specific project experience includes oversight of subsurface investigations for:

- Carthage Water and Electric Plant – WWTP Expansion
- City Utilities of Springfield CCR Impoundment Levees at the John Twitty Energy Center
- Empire District Electric Company CCR Impoundment Levees at the Asbury Power Plant and Riverton Power Station;
- Fellows Lake Dam Spillway Evaluation; Greene County, MO
- Forsyth WWTP Improvements;
- Huggins Lake Dam Evaluation and Modification; Texas County, MO
- Lebanon WWTP Improvements

DON NOWACK, P.E., R.G.

Mr. Don Nowack, P.E., R.G. will manage groundwater data collection and will be responsible for Hydrogeologic Modeling for the Project. Mr. Nowack has served as PPI's Environmental Services Manager since 2007, after spending the first part of his career with Sunbelt Environmental Services beginning in 1996. Mr. Nowack is a regional geology expert and is knowledgeable in a wide variety of local, state, and federal regulations.

Specific project experience includes field data collection and engineering analysis studies for the project list below.

- Springfield-Branson National Airport – Missouri Risk Based Corrective Action (MRBCA) Assessment and Groundwater Monitoring; Springfield, MO
- Clinton square hydrogeologic study; Clinton, MO
- Emory Creek Dam Evaluation; Taney County, MO
- Huggins Lake Dam Evaluation and Spillway Design; Texas County, MO
- Hydrogeologic modeling and subsurface drainage plan for the Pierce City Armory; Pierce City, MO

JOHN HOWLAND

Mr. John Howland will oversee all Wetland Delineation, Wetland Assessments, and Permitting for the Project. Mr. Howland has spent his career as an Environmental Coordinator for the Missouri Department of Natural Resources, Missouri Department of Transportation, and as a sole proprietor since 2006. Mr. Howland brings unmatched subject matter expertise to the Project Team.

Specific project experience includes:

- Brent McMinn Lake – Jurisdictional waters determination, Section 404 Permit issued, Mitigation plan developed and approved; Bollinger County, MO
- Missouri Department of Conservation – Stream and wetland assessments for wetland development projects; Cole, Randolph, and Butler Counties; MO
- Airgas Property c/o Central Missouri Professional Services – Jurisdictional waters determination; Callaway County, MO
- Empire District Electric Company – Asbury Power Plant – Jurisdictional waters determination approved by the USACE; Asbury, MO
- Orscheln Management Company – Wetland assessment and Section 404 permit –"No Permit Required" Application; Columbia, MO

MICHAEL KEATON, P.E.

Mid-Level Engineer | michael.keaton@amce.com

Education

- **Bachelor of Science, Civil Engineering**
  University of Missouri - Rolla, 2008

History

- **Allgeier, Martin and Associates, Inc.**
  2008 - Present

Registrations

- **Professional Engineer**
  Missouri

Memberships

- **National Society of Professional Engineers**

Summary of Professional Experience

Mr. Keaton joined the firm as a part time employee in our Rolla office in December 2007 while pursuing his engineering degree. After graduation Mr. Keaton came to work full time as an Engineering Intern in our Joplin office in December 2008, and has been involved in a wide range of civil engineering projects. Experience includes design engineering and construction plan development for Stormwater, Transportation, Sewer and Site Development projects.

Prior to joining Allgeier Martin, Mr. Keaton worked for the Missouri Department of Transportation from 2004 to 2006 as a Construction Inspector and Survey Crew Member while attending Crowder College. He also worked for Kiewit Construction Co. during the summer of 2007 as an intern performing various construction management duties.

MONNIE SEARS, R.L.S.

Survey Department Manager | monnie.sears@amce.com

Education:

- **200 hrs. continuing education - Surveying**
  NE Kansas Area Vocational Technical School - 1976-78

History

- **Allgeier, Martin and Associates, Inc.**
  2002 - Present
- **Crafton, Tull & Associates**
  1994 - 2001
- **Grand River Surveying**
  1992 - 1994
- **Green Country Surveyors**
  1984 - 1992

Registrations

- **Licensed Land Surveyor**
  Arkansas, Missouri, Kansas, Oklahoma
- **Certified Federal Surveyor**

Projects

- **Boundary Survey for Master Plan and ALP Update**
  Joplin Regional Airport, Joplin, MO
- **Topographic Surveys for Apron Renovations (Phase 1 and Phase 2)**
  Allen County Regional Airport, Iola, KS
- **Boundary Survey and Property Ownership Map for ALP**
  Municipal Airport, Branson West, MO
- **Boundary and Topographic Surveys**
  Crossroads Industrial Park, Joplin, MO

Summary of Professional Experience

Monnie is experienced in research, collection of field data, and preparing alignment surveys, profile surveys, boundary surveys, easement surveys, topographic surveys, ALTA surveys, and construction staking. He is experienced in writing legal descriptions for surveys of all types. He has experience establishing and recording property corners, section corners, and in establishing horizontal and vertical control for airport property surveys, and preparing ALP property maps.

CHARLES E. PATTERSON, P.E., Ph.D.

Senior Engineer | charles.patterson@amce.com

Education

- **Doctor of Philosophy, Civil Engineering**
  University of Missouri-Rolla, 1998
- **Master of Science, Civil Engineering**
  University of Missouri-Rolla, 1995
- **Bachelor of Science, Civil Engineering, Cum Laude**
  University of Missouri-Rolla, 1988

Registrations

- **Professional Engineer**
  Missouri

History

- **Allgeier, Martin and Associates, Inc.**
  2006 - Present
- **Wilson Hydro, LLC**
  2000-2006
- **Civil Engineering Professionals**
  1995-2000

Memberships

- **American Society of Civil Engineers**
- **Chi Epsilon, Civil Engineering Honor Society**

Summary of Professional Experience

Prior to joining Allgeier Martin in 2006, Dr. Patterson was a Project Engineer with WILSON HYDRO, LLC, Rolla, Missouri (July 2000 to August 2006), where he was responsible for hydrologic and hydraulic analysis and design and construction plan development.

He is also an Adjunct Assistant Professor of Civil Engineering at the University of Missouri-Rolla, Rolla, Missouri (August 1998 to present) where he currently teaches undergraduate Fluid Mechanics. He has also the Hydrology/ Hydraulics section for the PE test review and has taught graduate level courses including Hydraulic Structures and Water Infrastructure Engineering.

Dr. Patterson's work includes hydraulic transient modeling and analysis of water supply lines and deep wells for sewage injection, design of equipment to reduce hydraulic transient pressures, design and analysis of water supply networks for new systems and modifications of existing systems, design and analysis of sanitary sewer systems for new communities, including gravity lines and low pressure sewer lines, design of pump stations, hydrologic modeling of watersheds ranging in area from 0.2 acres up to 150 square miles, determination of water surface profiles, and design of detention basins and energy dissipation structures.

STEPHEN MIDDICK

Civil Designer | stephen.middick@amce.com

Education:

- **Associates of Arts, Drafting and Design**
  Crowder College

History

- **Allgeier, Martin and Associates, Inc.**
  2009 - Present
- **Sprenkle And Associates**
  2004 - 2008
- **Allgeier, Martin and Associates, Inc.**
  1998 - 2004

Certifications

- **Civil 3D Courses**
  Grading, Advanced Grading and Corridors and Cross Sections
- **Autocad**
  Autocad Civil 3D, Autocad INfraworks 360, Microsoft Office, Autodesk Land Development

Summary of Professional Experience

Mr. Middick has been with the firm for 13 years; 6 years in the electrical substation department and the past 7 years in the Civil Department. He previously worked for Sprenkle and Associates for 4 years on civil projects.

MR. JOHN DOYLE, P.E.

JD-M[C] Engineering in Dixon, MO

Bachelor of Science, Civil Engineering
University of Missouri-Rolla

Professional Experience

Mr. Doyle is a Professional Engineer with over 14 years' experience in the consulting industry and has been involved with numerous engineering projects throughout the State of Missouri. He serves as a Project Manager on hydrographic surveying projects including projects located on the Gasconade River, Osage River and Missouri River.

Hydrographic Survey of the Osage River

Capital Sand, Inc. | 2016

Work consists of hydrographic survey of active dredging site located on the Osage River near Wardsville, Mo. The survey was used to determine the stability of the dredge face observed at the location which provided information about the dredge site including material locations, grade control structure locations and dredge face material measured angle of repose.

Tadpole Island

Missouri River near Columbia, MO – Newt Marine | 2016

Work consists of a hydrographic survey of active Missouri River structure project located near Columbia, MO along pre- defined cross section survey lines provided by the USACE every 100' along the chute side of Tadpole Island. The project also requires cross sectional survey lines to show the structure(s) as built location, width, depth, etc. and provide shallow water habitat for pallid sturgeon while protecting the right back of the chute and Tadpole Island.

Hydrographic Survey of the Kansas City District Reach of the Missouri River

Missouri River Dredging Association, USACE | 2014

The work consists of a hydrographic survey of the bed of the Missouri River and was completed between the high banks of the main channel of the Missouri River. Data collection was performed along pre-defined cross section survey lines provided by the USACE every 500' along the main channel. The survey included 500 miles of the lower Missouri River ran from St. Charles, Mo., to Rulo, Nebraska. The survey was completed in the "summer months" of 2014. Data collected using survey grade bathymetry equipment and current data collection standards. Data was submitted per USACE format and used to study degradation issues found within the Missouri River.

Additional Information

Project Completion History

Project and Client Contact	Location	Budget	Final Billing	Staff Involved
Turkey Creek Wastewater Treatment Plant David Hertzberg, City of Joplin, MO	Joplin, MO	$14,500,000	$14,500,000	Dean Willis, P.E.
Shoal Creek Wastewater Treatment Plant David Hertzberg, City of Joplin, MO	Joplin, MO	$19,000,000	$19,000,000	Dean Willis, P.E.
Eisenhower Wastewater Treatment Plant Dennis Pyle, City of Monett, MO	Monett, MO	$11,300,000	$11,315,000	Dean Willis, P.E.
Rainfall Analysis, City of Springfield, MO	Springfield, MO	$30,000	$29,994	Joe Wilson, PH, PE Charles Patterson, PhD, PE
Port Flood Study Stacy Andreas, Lathrop and Gage, Kansas City, MO	Mason City, Iowa to Ste. Genevieve, MO	$29,800	$28,500	Joe Wilson, PH, PE Charles Patterson, PhD, PE
FEMA Scientific Resolution Panels National Institute of Building Sciences	Harris County, TX			Charles Patterson, PhD, PE Joe Wilson, PH, PE
Floodplain Mapping City of Sikeston, MO Jay Lancaster	Sikeston, MO	$85,000	Project in Progress	Charles Patterson, PhD, PE Joseph Wilson, PH, PE Sarah Simon, PE
Tindle Mills Floodplain Pete Radecki, Drury University	Old Tindle Mills Plant in Springfield, MO	$17,385	$17,385	Joe Wilson, PH, PE
Weber Lake John Koenig, Missouri Highways and Transportation Commission	Weber Lake, Wayne County, MO	$23,760	$28,308	Joe Wilson, PH, PE Charles Patterson PhD, PE
Fellows Lake Dam Spillway, City Utilities of Springfield Mr. Steve Squibb, P.E.	Greene County, MO	$114,000	$114,000	Rachel Goeke, P.E. Shane Rader, P.E. Don Nowack, P.E, R.G.
Branson Landing (Multiple Phases), HCW, LLC Mr. Rick Huffman	Branson, MO	$500,000	$500,000	Brad R. Parrish, P.E. Shane Rader, P.E. Rachel Goeke, P.E. Don Nowack, P.E., R.G.

Quality Assurance and Quality Control Procedures

AM and PPI have corporate systems in place for internal Quality Control (QC) of each sub-task within the proposed Scope of Work for this Project. Some of the Team's internal QC procedures are summarized in the table below. Quality Assurance for the Project will be provided by Peer Review between companies, collaborative Project Meetings among the Project Team, and by seeking out regular feedback from the City of Branson.

Project Task	Company	Quality Control Measure
Surveying	AM	Internal Review by Firm Principal
Hydrologic & Hydraulic Engineering Computations	AM	Internal Peer Review by Colleague, then Firm Principal
Subsurface Investigation Scope Development & Planning	PPI	Collaborative Development of Scope, Team Planning for Field Execution
Geotechnical Engineering Computations	PPI	Internal Peer Review by Colleague, then Firm Principal
Laboratory Testing	PPI	USACE and AASHTO Certified Labs, Equipment Calibrations, Use of Validated Computation Templates, Data Entry Check by Lab Technician Staff, and Result Review by Firm Principal
Report Preparation	AM and PPI	Internal Review Process with at least two independent colleague reviews, followed by Firm Principal Review
Design Drawings	AM	Internal Review Process with Project Manager Review followed by Firm Principal Review

www.amce.com

7231 East 24th Street
Joplin, MO 64804
417.680.7200

www.ppimo.com

10000 W. Hwy 160
Walnut Shade (Branson), MO 65771
417.561.8395

BLACK & VEATCH
Building a world of difference.

BLACK & VEATCH CORPORATION
8400 WARD PARKWAY KANSAS CITY, MO 64114 USA
+1 913-458-3253 | SievertCE@bv.com

March 11, 2016

City of Branson
Attn: David H. Miller, P.E, City Engineer
110 W. Maddux, Suite 310
Branson, Missouri 65616

RE: Request for Qualifications – Engineering Study for the Compton Drive Wastewater Treatment Plant (WWTP) Flood Protection Improvements

Dear Mr. Miller,

Black & Veatch has met with The City of Branson (City) to discuss in detail the Engineering Study for the Compton Drive WWTP. We understand the City faces significant challenges in determining viable options for flood protection of the facility. They include the risk of physical damage to this key asset, including loss of plant operations due to inundation, as well as potential environmental impacts to Lake Taneycomo resulting from sanitary sewer overflows. We are confident we can address these challenges and complete the study on time and within budget, by building on our local, national and international experience on similar projects.

In our Statement of Qualifications, we have included our staff numbers, their qualifications and office locations. We have also provided our proposed Approach and Schedule to Phase I. This material demonstrates the following benefits to the City:

- **Trusted Partner** - For the past 5 years Black & Veatch has worked with the City at the Cooper Creek WWTP, planning for future expansion while helping to maintain and upgrade the facility. Through these efforts, and our previous work on the White River and Table Rock Dam, we have demonstrated an approach and commitment focused on Branson's success.
- **Valuable Insight** - We will hit the ground running with hydraulic modeling we have already completed for the Branson Landing project and FEMA Floodplain Mapping for proposed improvements in Hollister.
- **Committed to Your Success** - Our team has worked extensively with the USACE, FEMA and MoDNR, establishing strong working relationships that will facilitate positive dialogue and keep progress on the Study moving forward efficiently. Additionally, we will explore the potential for outside funding to maximize the level of flood protection for the City.

Thank you for this opportunity to continue our support of your efforts to protect the people and property of Branson, by being good stewards of the local environment and the City's assets. We welcome any questions you may have about our qualifications, and can provide additional information at your request.

Very truly yours,

BLACK & VEATCH CORPORATION

Charles E. Sievert, PE
Project Manager

CITY OF BRANSON, MISSOURI

Trusted Partners
Valuable Insight
Committed to your Success

Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements

BLACK & VEATCH
Building a world of difference.®

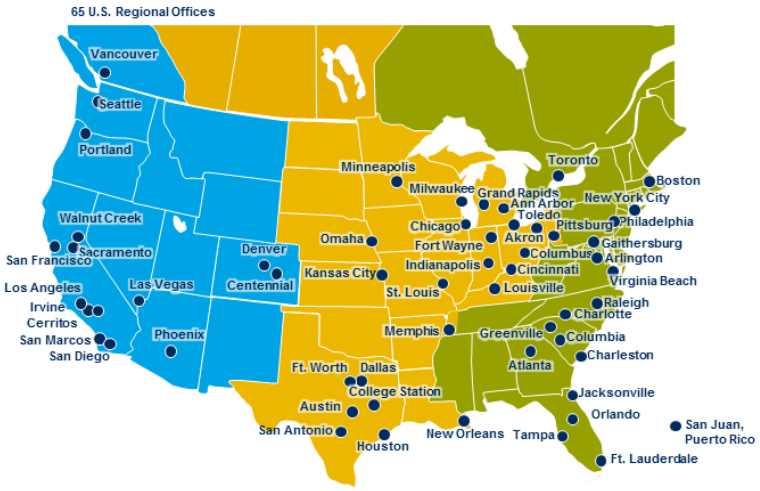
Branson
Missouri

STATEMENT OF QUALIFICATIONS

BLACK & VEATCH
Building a world of difference.®

STATEMENT OF QUALIFICATIONS

The City of Branson (City) is looking for a partner that can provide ample available and qualified staff with a proven record of on-time, on-budget delivery of flood-protection projects. Black & Veatch is that partner and more. We take pride in the fact the majority of our work is ***repeat business.*** This was earned through the delivery of high-quality projects not only on time and on budget, but also with a change-order percentage of 1.5%, which is significantly below the industry average of 5%. Three key aspects define our success:



Black & Veatch Overview: more than 100 years in business; more than 100 offices worldwide; ranked in the Forbes "500 Largest Private Companies in the U.S" with more than 10,000 employees; projects completed in over 100 countries on 6 continents.

- **Design Approach/Philosophy** –We listen to our Clients concerns and needs, developing independent and honest recommendations that create the best value.
- **Global Resources Applied Locally** – Since 1915, Black & Veatch has specialized in the local application of world-class water engineering. With our globally integrated workforce, including approximately 4,000 in working in the Water sector and more than 500 located in Kansas City, we bring to the study the strengths of our communities of practice, specialty practice leaders, technology leaders and subject matter experts.

  Sustainable Planning and Design –Black & Veatch is committed to providing energy-efficient and sustainable solutions that support "triple bottom line" benefits, including life-cycle economics, local quality of life, and environmental quality.

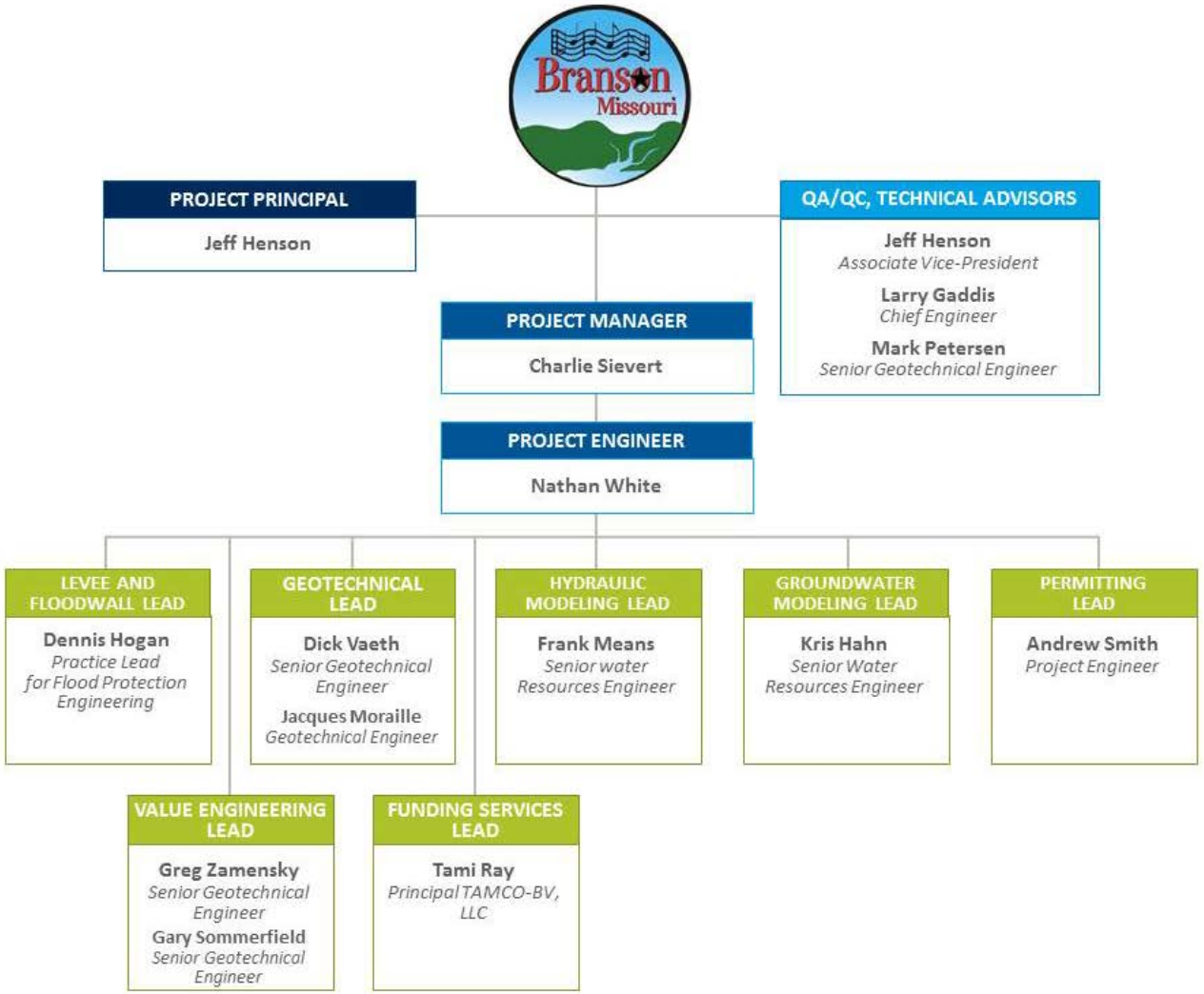
Black & Veatch Staff Breakdown by Discipline			
Administrative	1,924	Foundation/Geotechnical Engineer	39
Architect	29	GIS Specialist	12
CADD Technician	988	Geologist	24
Chemical Engineer	201	Mechanical Engineer	597
Civil Engineer	873	Project Manager	727
Construction Manager	483	Safety/Occupational Health	86
Cost Engineer/Estimator	111	Security Specialist	13
Electrical Engineer	869	Structural Engineer	204
Environmental Engineer	16	Technician/Analyst	1,035
Environmental Scientist	61	Other Employees	1,595

TEAM EXPERIENCE

BLACK & VEATCH
Building a world of difference.®

TEAM EXPERIENCE – ORGANIZATION CHART

We've assembled a team lead by Charlie Sievert who you know from our ongoing Cooper Creek WWTP work. This team as you'll see from their following brief resumes brings tremendous flood control and flood protection study, design, and construction experience.



Project Principal	**Jeff Henson, PE**, Associate Vice President has been with Black & Veatch since 1985 with a distinguished career in water resources related projects. Before his recent promotion to Client Manager, he was the Director of the Water Resources Department with oversight of a wide range of flood control projects, wet weather programs, studies and designs.
Project Manager	**Charlie Sievert, PE**, has been with Black & Veatch over 25 years with wide ranging national and international experience in flood control and stormwater study and design, water distribution and transmission design and construction, and sewer rehabilitation.
Project Engineer	**Nathan White, PE**, started his career at Black & Veatch in 2006 and continually demonstrates the hands-on leadership needed to lead the technical management of a wide variety of projects. His ongoing efforts on the Cooper Creek WWTP improvements are proof of his technical skills.
QA/QC, Technical Advisor	**Mark Petersen, PE, GE**, is a senior geotechnical, civil and structural engineer with over 33 years of experience with Black & Veatch. His national and global experience in the water and energy sectors ranges from dams to nuclear facilities.
QA/QC, Technical Advisor	**Larry Gaddis, PE**, has over 30 years of experience with Black & Veatch and is the Chief Engineer for the company's Water business. His project experience encompasses all aspects of study, design, and construction phase services.
Levee and Floodwall Lead	**Dennis Hogan, PE**, is a Practice Lead for Flood Protection Engineering. During his 16 years of experience, Dennis has focused on critical infrastructure flood protection work affected by climate change and extreme storm events. That includes managing the post-Hurricane Sandy risk assessment, planning, modeling, design, permitting, and construction of substation flood protection.
Geotechnical Leads	**Dick Vaeth, PE**, is a geotechnical design engineer for water, wastewater, hydropower and transportation projects. Dick has been with Black & Veatch since 1973 and his experience includes field supervision of geotechnical investigations, resident engineering for dam construction, and 13 years of site design on projects for utilities, industries and the federal government.
Geotechnical Leads	**Jacques Moraille, PE**, is a geotechnical engineer with nearly 25 years of experience providing resident engineering services for dams, preparing geotechnical reports, earthwork specifications, and consulting services. Jacques has been with B&V since 1997
Value Engineering Leads	**Greg Zamensky, PE**, is a dam and geotechnical engineer with 25 years of experience working on more than 100 dams across the United States. This work includes emergency response, forensic evaluation, investigation, development of design/construction documents, preparation of emergency action plans and construction oversight.
Value Engineering Leads	**Gary Sommerfield, PE, GE**, is a senior geotechnical engineer at Black & Veatch with more than 35 years of experience on subsurface investigations and designs for power plants, dams, levees, bridges, and transmission and telecommunication projects.
Hydraulic Modeling Lead	**Frank Means, PE**, Senior Water Resources Engineer, specializes in open channel hydraulics modelling for dams, bridges and inline structures. He has 25 years of experience working with USCACE's HEC-RAS and HEC-GeoRAS models, FEMA models and mapping.
Groundwater Modeling Lead	**Kris Hahn, PE**, is a Senior Water Resources Engineer with Black & Veatch. In his 21 years at Black & Veatch, his focus has been using the three-dimensional groundwater flow application Groundwater Modeling System (GMS) in conjunction with ArcGIS to assist clients with designing wells, and studying seepage beneath dams and into deep bedrock tunnels.
Funding Source Lead	**Tami Ray** has a wide variety of grant and loan experience with a strong emphasis on federal and state program development and multi-discipline project funding and management. Her experience and knowledge come from a diverse background including working for city and county government, serving design firms as a program development specialist, owning and operating a multifaceted Florida-based corporation, and serving as Director of Program Development for a Design/Build-CM@Risk Firm.
Permitting Lead	**Andrew Smith, PE, CFM, ENV SP**, is a Project Engineer with 16 years of experience at Black & Veatch. His permitting experience includes levee certification, floodwalls, and a wide variety of flood projects requiring various USACE, FEMA, and State and local permits.

(Full resumes are available for all staff members on request.)

EXPERIENCE SUMMARY

BLACK & VEATCH
Building a world of difference.®

EXPERIENCE SUMMARY – SIMILAR PROJECTS

Black & Veatch works around the world on flood control, flood protection and disaster response projects. The following describes a representative selection of our recent relevant projects in the U.S.

Many of our large lock and dam projects are driven by transportation, generation of power, recreation or water supply objectives. Some of the studies have been driven by growth. Underlying all of the projects is the desire to protect people and property. Increasingly, projects are developed in reaction to natural disasters. Many involve studies, designs and construction done proactively in anticipation of predicted events.

Projects like our Flood Insurance Study for Hollister while under contract with FEMA Region VII and the Branson Landing Flood Study were driven by development. Our contract with the US Corps of Engineers for the design of the Table Rock Dam Auxiliary Spillway and Tainter Gate was to correct a hydrologic problem USACE discovered. Projects like a recent Sherman Army Airfield Upgrade project at Fort Leavenworth while under contract with the US Corps of Engineers involved studying feasible ways to expand the airfield and levee system for protection from the 100-year storm so the facility could deliver 24/7 operation in all weather conditions. ***We have received numerous Contractor Performance Assessment Reports (CPAR) from USACE noting our on-time, on-budget performance.***

Black & Veatch is often called on for major and complex emergency response investigations, studies and remedial designs. Examples include responses to Hurricanes Sandy, Katrina and Rita, and the major earthquake that caused the Fukushima Nuclear Reactor leak in Japan. We performed these assignments under open-ended or task order contracts with the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (USACE), and the Nuclear Regulatory Commission (NRC), as well as private utilities.

In response to the Fukushima Nuclear disaster, the NRC requested Xcel Energy to perform reevaluation of all external flooding sources at the Prairie Island Nuclear Generating Plant and Monticello Nuclear Generating Plant in Minnesota. Black & Veatch performed all of the critical analysis including screening of approximately 360 dams, dam breach analysis for 128 dams and hydraulic routing of the Probable Maximum Flood, and calibration of a hydrologic model for a 45,000 square mile watershed. The project coordination with Xcel Energy, NRC, and USACE and associated Quality Control and Document Control were driven by high security and high sensitivity given the potential risk at nuclear facilities.

Recently, Black & Veatch completed the new surge protection system for New Orleans, which included: the design of 14 miles of earthen levees; the design of four miles of floodwalls, including for the new Causeway Bridge Overpass; the design of four gate closure structures to hold back surges as well as allow traffic to flow; and the design-build of three major pump stations, including 17th Street Canal, Orleans Avenue Canal and London Avenue Canal. Also, after the devastating damage of Hurricanes Katrina and Rita in 2005, Black & Veatch provided FEMA reviews on more than 8,000 of 25,000 Public Assistance Projects, with those 8,000 projects having a value of over $2.5 billion.

EXPERIENCE SUMMARY

Table 1. Representative Flood Risk Management Examples

PROJECT	LOCATION	STRATEGIC PLANNING	GIS	PERMITTING ASSISTANCE	ENVIRONMENTAL STUDIES	H&H MODELING	FLOOD MAPPING	SITE INVESTIGATIONS	STRUCTURAL ANALYSIS	CONTROL STRUCTURES	FLOODPLAIN IMPROVEMENTS	RIVER, TIDAL AND SEA DEFENSES	FLOOD RESPONSE AND RECOVERY	CLIMATE CHANGE ADAPTATION	STUDY	DESIGN	CONSTRUCTION PHASE SERVICES
NYC DEP Oakwood WWTP	Staten Island, NY					■	■	■	■		■	■		■	■	■	
DNREC Flood Risk Assessment, Crude Oil Facility	Seaford, DE	■				■	■	■	■		■	■	■		■		
Private Client Flood Wall Protection	Kearny, NJ	■				■	■	■	■		■	■		■	■		
Hurricane Katrina: Relief Capital Needs Plan & Hurricane Protection Program	New Orleans, LA	■		■				■	■	■		■	■	■	■	■	
Everglades Agricultural Area A-1 Reservoir	FL		■		■	■	■	■		■	■	■		■	■	■	
Fairfax Water Dam Engineering Contract	Fairfax, VA			■		■	■		■	■					■	■	■
McCook Reservoir Main Tunnel and Gates	Chicago, IL	■		■	■	■		■	■	■				■	■	■	■
Central WWTP Post-Flood Assistance	Nashville, TN							■	■				■			■	■
FEMA Flood Region VII Insurance Study	Iowa and Nebraska		■			■	■								■		
RM Clayton WRF Post-Flood Assistance	Atlanta, GA							■	■				■			■	■
Upper Las Vegas Wash Detention Basin	North Las Vegas, NV	■		■		■	■	■		■	■			■	■	■	■
FEMA Base Flood Elevation Review and Flood Analysis	Ocala, FL	■	■	■		■									■		
FEMA Technical Assistance Contract/NISTAC	LA; MS; AR; ND							■	■	■		■	■		■	■	■
Mission Flood Control Projects	Mission, KS	■		■		■	■		■	■	■	■			■	■	■

PROJECT APPROACH & SCHEDULE

BLACK & VEATCH
Building a world of difference.®

PROJECT APPROACH AND SCHEDULE

In its setting along the shore of Lake Taneycomo, the Compton Drive Wastewater Treatment Plant (WWTP) is not just a critical City asset but also a symbol of the City's commitment to serving and protecting the community. The crystal clear waters of Lake Taneycomo, which allow you to see full depth to the rocky bottom, represent Branson's commitment to protecting its environmental quality and economic future.

"The City will encourage the quality growth of a healthy, wholesome, clean environment in which people live, work and visit."

Protecting the Compton Drive WWTP will be challenging because the City cannot control all of the variables that impact or potentially might impact the plant. While the majority of the physical assets that make up Compton Drive WWTP are fixed in elevation, the water elevations resulting from releases from Table Rock Dam are not fixed, whether they stem from a change in the USACE White River Water Control Plan or changing weather patterns.

Black & Veatch has worked extensively with federal, state and local entities to establish guidance documents and strategies for managing major natural systems including waterways. For example, ***in 1950 President Harry Truman appointed our company's co-founder, N.T. Veatch, to the President's Water Pollution Control Advisory Board.*** We continue to support the US Army Corps of Engineers, Federal Emergency Management Agency, and many other agencies to resolve challenges, especially those associated with flood control.

Challenges of Managing the White River Water Control Plan

Our approach will be quite similar to how we approached the Anti-degradation Study for the Cooper Creek WWTP expansion. In that case, the anti-degradation policy was new and MDNR had not yet reviewed or approved one for a lake setting like Lake Taneycomo. For the past 5 years, it has been a privilege to have worked with the City at the Cooper Creek WWTP, planning for future expansion and helping maintain and upgrade the existing facility. Starting with good planning and good communications, the effort has resulted in accolades from Missouri Department of Natural Resources (MDNR). It has helped that Black & Veatch maintains a good reputation, rapport, and mutual respect with MDNR.

Immediately following the Notice of Award on the Compton Drive WWTP study, we will schedule a workshop where the City and Black & Veatch will commit to developing a solid defensible Scope of Work and Fee for review and approval by the City's leadership. We are in agreement with your proposed Phased Approach, as it reflects how we have approached the Cooper Creek WWTP issues. As necessary, we will support City staff in presenting the scope and fee to City's leaders.

PHASE 1 – CONCEPTUAL DESIGN

Immediately following the Notice to Proceed, we will mobilize our entire team and run all initial Tasks concurrently:

- Collect and review existing data
- Engage with regulatory agencies
- Initial screening of potential funding sources
- Screen interim flood protection options

Collect and Review Existing Data

This Task will involve City staff reviewing archive files and tapping into the memories and observations of Public Works staff, plant operators and others who have witnessed firsthand high-water events like the 4 that have occurred since 2008. Additionally, Black & Veatch will review the hydraulic modeling we completed for the Branson Landing project, the Flood Mapping we performed under contract with FEMA for proposed development in Hollister, and historic flow records and statistical analysis of those flows we used during our Cooper Creek Anti-degradation Study.

During the collection and review of existing data, in particular the review of existing geotechnical data, we will make recommendations for additional field investigations. We will then mobilize a local geotechnical firm, Palmerton & Parrish, who we have worked with in the past.

Engage with Regulatory Agencies

At a minimum, we feel it is important to engage with the US Army Corps of Engineers, Federal Emergency Management Agency, and MDNR. We need to understand how these three key regulatory agencies are going to be involved in defining the design criteria for flood protection of the Compton Drive WWTP. For example, the USACE has its current White River Water Control Plan. We will want to know: 1) how often does the plan change; 2) how closely is it followed; and 3) will USACE want a higher level of protection to reduce potential conflict with the plan. FEMA interests will be more focused on flood damage and insurance issues. This includes the WWTP and other City assets protected by the new flood protection improvements, as well as potential unintended consequences to neighboring properties and mitigation issues: ***No Rise Certification*** will be required. We worked successfully with USACE and FEMA to provide a No Rise Certification on the Branson Landing Development as well as the Flood Mapping. MDNR will have interest in the level of protection being considered, given the potential environmental impacts. The potential impacts vary considerably, from small collection system overflows to complete WWTP inundation and complete loss of operation, resulting in significant and potentially long duration discharge of untreated sewerage into Lake Taneycomo. What we will achieve through these engagements are and understanding of the USACE operation of Table Rock Dam and release rates. From FEMA we'll learn what level of protection they'll regulate to, and from MDNR we will get support for an appropriate level of protection the City can afford.

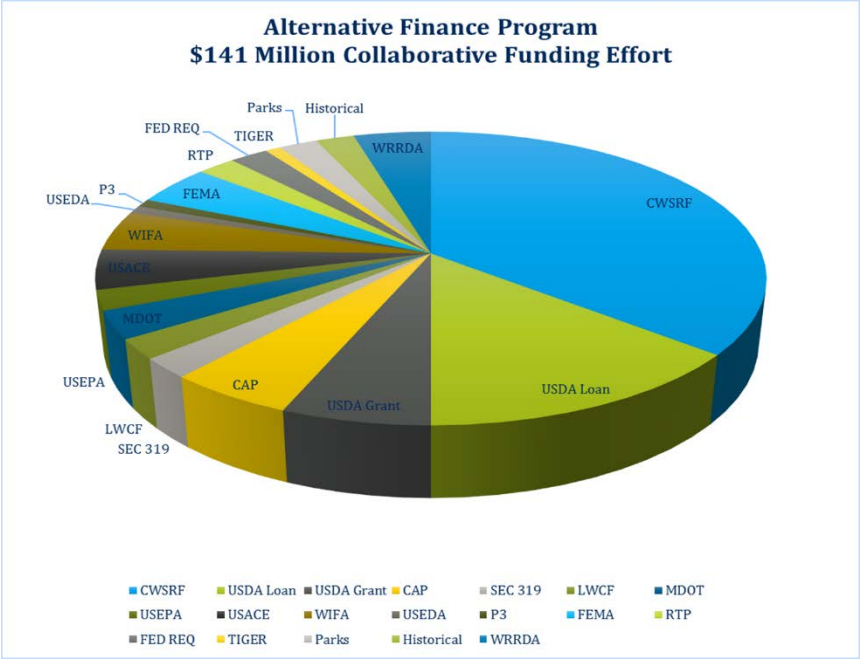
Initial Screening of Potential Funding Sources

Black & Veatch offers an Alternative Funding Service (AFS) team that can greatly enhance the implementation of capital improvement projects by working through the complex alternative funding process on behalf of clients. Our AFS team works diligently with federal/state agencies to keep up-to-date on the latest offerings and understand funding allocations and uses within a specific program. This value-added service supports every aspect of the funding process from "concept to completion." The goal of our AFS team is to keep local costs reasonable and devoted to the greatest benefit of rate payers.

The following is a current list of alternative funding agency incentives that will position this project for the optimum financial resources such as lower-interest on loans, expansion of loan terms, principal forgiveness, and grants:

- Water Quality Improvement
- Health Benefits
- Regulatory Compliance
- Improved Operations
- Long-term reduction in O&M Cost
- Flood Control Improvement

Understanding the complexity of the City's proposed program, we believe that many of the qualifiers noted above exist. Each of the project elements that meet these agency incentives may create additional program eligibility and greater financial benefit. An **active example** of this approach by the Black & Veatch AFS team within the State of Missouri is identified in the pie chart graphic, below. It depicts our AFS plan of action and identifies financial resources to help meet the total project cost. The chart identifies 19 funding agency resources that are either currently under agreement or pursuit by the client. This effort is ongoing throughout the program and may significantly change the financial outlook, with 30% of the project cost in principal forgiveness or grant. In any case, it will reduce the need to increase utility rates and expand borrowing capacity.



This approach is specific to the client and is indicative of how our team would serve the City of Branson over the duration of the project.

Our AFS team proposes to develop a comprehensive view of all available financial resources and a plan of action. The team will then maximize the financial benefit that coincides with the project's needs, schedule and elements. The ability to use one resource to leverage another and our team's understanding of the rules surrounding each agency and program will promote a successful outcome for the City.

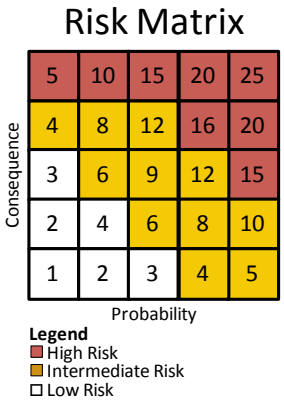
Screen Interim Flood Protection Options

Black & Veatch has been called into action in recent years to help communities recover from natural disasters that brought devastating flooding. Our experience puts us in a unique position to evaluate and recommend interim measures, to immediately provide Branson with protection above current levels. We have talked with City staff and listened to their concerns over the increasing frequency of high water levels at the Compton Drive WWTP. It is clear that 'dodging another bullet" or "living on borrowed time" is NOT the level anyone prefers. At the same time, haste will make waste. It will take a concerted effort to fully evaluate the physical challenges of protecting a plant that sits amid neighbors on Lake Taneycomo, to fully understand the impacts, risks, rewards, and costs of the various levels of protection. In addition to the time for Conceptual Design, there will be time associated with the full Design, Bid, and Construction phases of this project. While the Conceptual Design phase can be completed in 6 months, if decisions linger from regulatory agencies, from Public Input or other issues, this initial phase could span a year or more. The Design, Bid, and Construction phases might take another 2 years before the desired level of protection is fully implemented, and with 4 high-water level events in the past 7 years, it is

reasonable to assume there will be additional events in the coming 5 years. That is why we will identify viable, cost-effective options for interim protection until the ultimate solution is designed and constructed. We will take into account not only your experiences with previous interim flood protection measures you've taken; we will quickly evaluate your existing levee system and dewatering wells. From your most recent experience with high water levels in late December as well as previous events and your experience with those we may quickly find that something like the Hesco System® or Big Bag® supported by your existing dewatering wells may be sufficient to get you an additional 4 – 5 feet of protection. We will also evaluate the check valves in the clarifiers and other criteria assets to identify vulnerabilities and to help you ensure you manage groundwater pressure when dewatering a clarifier.

Throughout this project we will maintain good communication through routine phone and email correspondence, monthly -progress meetings, and focused workshops where key information is discussed and key decisions will be made to keep the project moving forward efficiently. We found the workshops held throughout the Cooper Creek WWTP project to be very effective in getting stakeholders to discuss pertinent issues, and come away with key decisions and definitive action plans.

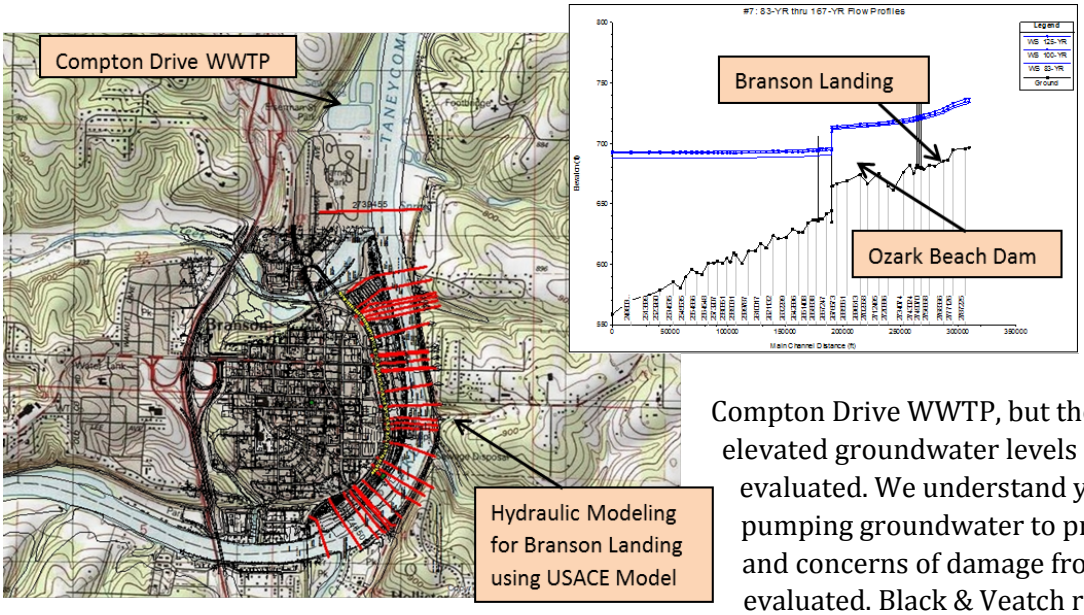
A key outcome of initial steps will be an understanding of the regulatory agencies' input into the Design Criteria. From that, we will help the City finalize the appropriate Design Criteria. The results of our analysis of alternatives may identify significant challenges in meeting all elements of the Design Criteria. Our risk management approach will include development of Compton Drive WWTP asset condition listings, asset hierarchy, and interdependency, and as requested this will include additional City assets like the Administration Building and Recycling Facility. There is a wide range of options for the Compton Drive WWTP, from "do nothing" to "decommissioning the plant" and taking all of the flow to the Cooper Creek facility. To understand and evaluate the large number of viable options that exist between these two extremes, we need to assign a quantifiable and comparable value to assets and options for protecting those assets. We anticipate workshop settings with City Staff where a comprehensive register of assets and potential failure modes, the causes thereof, and the risk consequence severity and probability of occurrence scores are developed collectively and agreed upon. This will not be as complicated as it sounds because the list of assets under consideration is relatively short. ***For example, the City has already taken a major first step in this process when it looked at the Compton Drive WWTP in whole and identified the Influent Pump Station and its backup power source as a High Consequence of Failure asset and because its relative elevation to the rest of the plant also put it as a High Probability of Failure. You already have modified the facility and raised key elements to the 100-yr flood level.*** We will assist the City in taking this process through the entire facility and potentially surrounding City assets for a more holistic evaluation. For example, you may have a critical piece of equipment nearing the end of its life cycle and for little additional expense you might upgrade to a water-proof version or simply raise it and mount it at a higher elevation without impacting operation concerns, but greatly reducing the risk of failure.



Risk Register with consequence and probability matrix provides a quick and easy to understand review of major risks and mitigation strategies.

Running concurrent with the assessment of the assets being considered for enhanced flood protection, we will run necessary hydraulic modelling based on the design criteria. We can start this effort early and complete it efficiently because of all of our past work on the White River.

Black & Veatch performed hydraulic modeling for the pre- and post-conditions of the Branson Landing Development and determined its effect on the FEMA Floodplain and Floodway. Black & Veatch worked with the developer, architect, FEMA, USACE, and surveyor to build the HEC-RAS model showing the changes in water surface elevations and floodway due to construction. The USACE reviewed the newly constructed HEC-RAS models and provided comments. Additional coordination with the USACE was conducted to address their comments and provide a satisfactory pre and post hydraulic HEC-RAS model. Layout of boardwalk piers, a floating marina anchored with piers, and a potential fishing pier were analyzed to determine the effects on the FEMA Floodway. With the modelled layout, a slight increase in the Floodway water surface elevation was produced. Suggestions to changes in the layout were provided to eliminate the rise in the Floodway water surface elevation in order that a "No Rise" certification could be obtained for the planned development. The modeling results would also be used in obtaining a USACE Section 404 of the Clean Water Act permit. This is an example of a successful approach to working with the regulatory agencies to resolve flood-related issues.



High lake levels and possible inundation are the major concern in protecting the Compton Drive WWTP, but the impacts from elevated groundwater levels also have to be evaluated. We understand you're currently pumping groundwater to protect the plant, and concerns of damage from uplift will be evaluated. Black & Veatch routinely performs three-dimensional groundwater flow evaluations for a wide variety of underground projects. These studies include the evaluation of seepage paths and flowrates beneath dams and embankments, design of dewatering facilities, estimation of seepage into tunnels, and evaluation of the interaction between groundwater and surface water, to name a few. Black & Veatch recently completed an evaluation of the dewatering requirements for a new dam in California for the Los Angeles Department of Water and Power. Using hydrogeologic data collected from pumping tests and a series of piezometers, detailed groundwater flow modeling was used to estimate seepage from an existing reservoir located just upstream of the new dam site, which proved to be a key factor in determining the dewatering requirements.

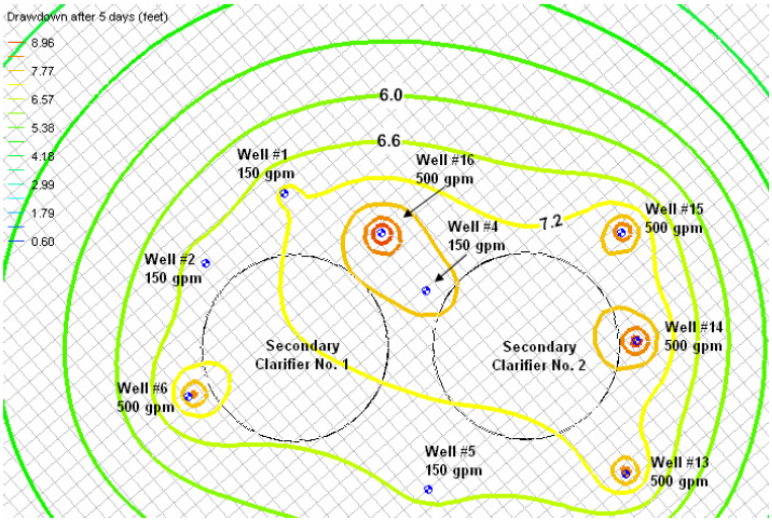
Black & Veatch designed permanent dewatering wells for the purposes of lowering groundwater levels below the foundations of several secondary clarifiers at a wastewater treatment plant in Pueblo, Colorado. The design required a pumping test at the site, evaluation of the limitations of the existing wells at the site, and three-dimensional groundwater flow modeling to optimize the number and configuration of new high-capacity dewatering wells, to achieve the target groundwater levels at the site in the desired amount of time.


Compton Drive Wastewater Treatment Plant (looking south)

The floodwater evaluation will include structural issues given the limited footprint particularly on the lake side, and it will also consider groundwater migration. The groundwater model will use input from your existing dewatering wells and geotechnical information ultimately determine the most cost effective means of managing the groundwater. Once the 3-D model is built we can quickly run various scenarios based on different water levels, floodwall type and depth to evaluate viable cost effective options.

Our Water Resources Staff and Geotechnical Staff work together seamlessly to evaluate effective methods of mitigating seepage through flood protection systems, levees, floodwalls and dams. While the Compton Drive WWTP, with its close proximity to Lake Taneycomo, may appear to be a pretty unsurmountable challenge, Black & Veatch has successfully resolved similarly daunting challenges in the United States and around the world.

Permanent Dewatering Well Evaluation and Design for WWTP - Colorado



The geotechnical investigations will run concurrent with the hydraulic modeling and Risk Assessment as it will be an iterative process of evaluating the viable levels of protection achievable. For example, if through input from the various regulatory agencies and other sources, the City determines they would like to achieve 100-yr flood protection with 2-ft of freeboard, that will likely require a floodwall that is 10 – 12 feet or more, higher than the existing shore side levee. That might be achievable physically with all adverse impacts mitigated, but financially it might have to be accomplished in phasing. For example, one option is building the base section and taking that to a lower level of protection, and the in the future adding to the wall height to get to the full designed 100-yr flood protection. The City will also likely consider the potential risk associated with climate change and potential changes in the Corps' management of Table Rock Dam, and provide for increasing the level of protection in the future by designing a floodwall that can be raised at some point in the future. There will be many factors to consider and weigh, but we will work to provide the City with viable options, each being measured not as apples to oranges but as apples to apples.

Our Approach reflects our ability to hit the ground running because of our past experience. It will also result in viable options for interim flood protection measures that compliment your existing levee system and dewatering wells. We'll deliver those options within 6 weeks of the Notice to Proceed. We have also demonstrated our long and distinguished working relationship with the regulatory agencies that will allow us to get their input early and help you establish the appropriate design criteria. Our

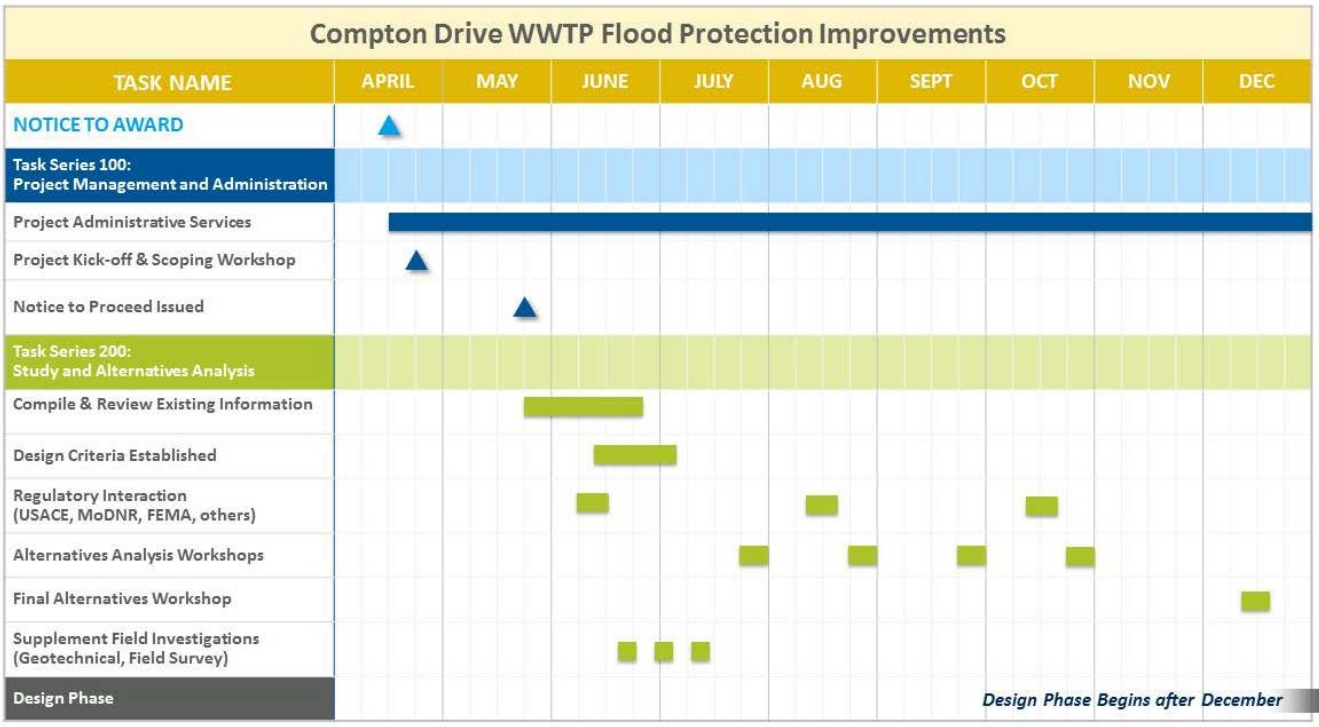
Approach and our Staff Resources will allow us to run all allowable tasks concurrent which also helps to compress the schedule as shown below.

SCHEDULE

Our schedule (below) shows that the initial Conceptual Design Phase can be completed by year's end. There are assumptions being made on the amount of existing data that is available and potential of additional geotechnical information and potentially groundwater movement investigations. Likewise, assumptions have been made on the level of engagement with regulatory agencies and their responsiveness to requests for input. While we cannot control the responsiveness of the agencies, we have worked extensively with them and have well-established working relationships that will help to facilitate positive dialogue and keep the project moving forward efficiently.

The reasons we will be able to meet the aggressive schedule are:

- Our knowledge of the operation Table Rock Dam and hydraulics of White River, so no time and effort is wasted on getting up to speed
- Local qualified staff supported by Black & Veatch's global team
- Recent relevant experience responding to flooding from Hurricanes Katrina and Rita, Superstorm Sandy, and the tsunami in Japan.
- Alternative funding to leverage local dollars and allow a complete solution.
- Proven approach to flood management projects for critical facilities



VALUE ENGINEERING

BLACK & VEATCH
Building a world of difference.®

VALUE ENGINEERING

Our approach to Value Engineering (VE) focuses on the total life of the job, accounting for the future impacts of the cost of money and the escalating cost of labor, materials, fuels, and power. This approach utilizes a Certified Value Specialist (CVS) to manage the entire study. Our studies typically target the best long-term value rather than the greatest short-term savings, by using present worth analysis. ***Our VE alternatives seek to obtain the best value for the dollar expended, and routinely include issues such as operability, maintainability, operations during construction, aesthetic issues, security and safety, environmental impacts, staffing,***

constructability, and public and political acceptance.

VE Team at Future White River, Indiana Working Shaft Site
The VE team focused on alternatives that would reduce the length of the tunnel without affecting the capacity, and alternatives that would shorten the distance or eliminate the adits to the tunnel.

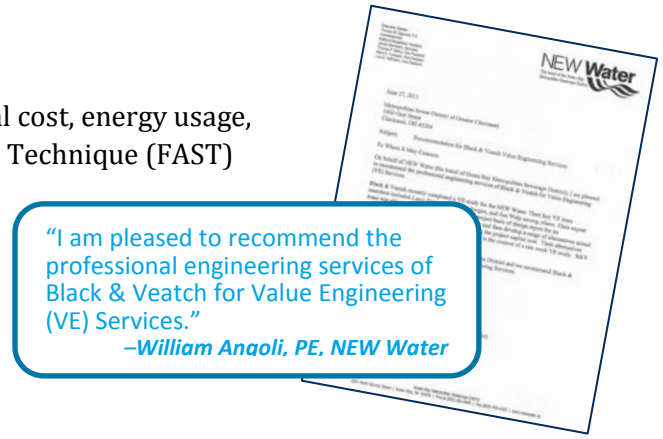
Our approach also includes a focused analysis of the capital cost, energy usage, and life cycle cost, and includes Function Analysis Systems Technique (FAST) diagramming. Risk analysis is routinely performed to augment the function analysis in a VE effort.

The study organization is based on three specific groups of activities:

- Preparation Effort
- Value Engineering Workshop Effort
- Post-Workshop Effort

This project approach has been used successfully on the value engineering of more than 500 projects performed to date by Black & Veatch. The organized approach allows us to maintain a quick turn-around time for the study and the submittal of a Value Engineering Report.

Every key team member in our Organization Chart has participated in at least one VE Study and we have numerous additional staff from our Management Consulting, Construction and Procurement, and other Divisions whose primary role is leading or participating in VE Studies whether for our own projects are as a third-party Consultant.



Black & Veatch Key Project Cost Savings

CLIENT/PROJECT	EST COST	COST SAVINGS IDENTIFIED
Water Treatment Plant Value Engineering and Constructability Reviews, County of Henrico, VA	$140M	$4M
South Bakersfield WTP VE Workshop, California Water Service Company, Bakersfield, CA	$45M	$5M
D.E. Benton Water Treatment Plant Design, Value Engineering Study, Raleigh, NC	$97M	$4M
Surface Water Collection and Treatment Project, Tampa Bay Water, Tampa, FL	$550M	$55M
Bull Run Supply Treatment, Portland Water Bureau, OR	$54M	$5M
WWTP VE Workshop, City of Modesto, CA	$135M	$20M
WWTP VE Workshops, City of Chico, CA	$30M $40M	$10M $8M

QUALITY ASSURANCE

BLACK & VEATCH
Building a world of difference.®

Quality Assurance

Our Quality Assurance / Quality Control (QA/QC) approach is a comprehensive program that controls quality in all aspects, encompassing everyone on the project.

Our continuous and proactive quality process will begin with early planning and end with completion of all contractual responsibilities, representing an integral part of the overall management effort involving specific processes and monitoring tools.

Black & Veatch will develop and implement **a Quality Management Plan (QMP)** to:

- Provide an approach that builds integrated goals for design quality.
- Develop and implement a training plan that provides team members with an understanding of our approach to quality project execution.
- Identify areas needing improvement during project execution and implementing corrective actions to improve project performance.
- Set expectations with teaming partners for quality deliverables. Senior Black & Veatch technical advisors will work with team members in their specialty areas. We will monitor and participate in all aspects of project execution.

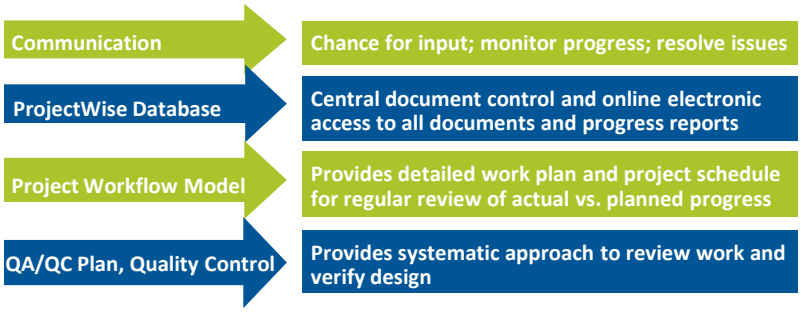
The Black & Veatch Team will establish an effective QMP addressing at a minimum, the following:

- Management
- Responsibility
- Management System
- Design Control
- Document Control
- Purchasing
- Process Control
- Inspection and Testing
- Nonconformance
- Corrective Action
- Quality Records
- Quality Audits
- Training

SCHEDULE CONTROL PROCEDURES

Our experience has shown that detailed planning at the project's outset provides the greatest opportunity for a successful ending. The schedule developed during early project planning activities will be the baseline. The key to successful management of project schedules is built-in flexibility that allows for adjustments in scope or direction while still maintaining the key milestone dates. Our proposed schedule will do exactly that.

CONSTANT COMMUNICATIONS

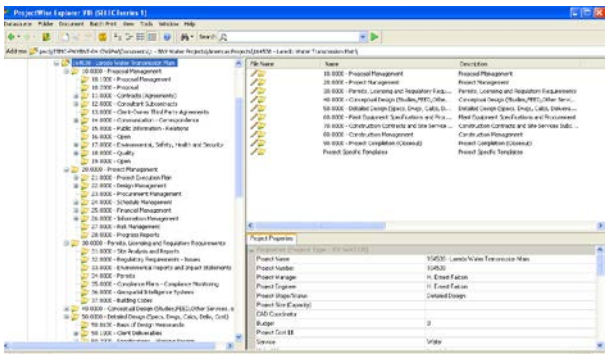


Charlie Sievert will be responsible for the project staying on schedule and within budget, and making sure you are kept informed of all activities and issues so as to minimize surprises. Charlie has demonstrated his commitment to bringing the right resources to the project and maintaining good channels of communication within the team, with regulatory agencies, and most importantly the City.

PROJECT CONTROLS

Black & Veatch has proven project controls in place to manage communication, documents, schedule, quality and costs.

ProjectWise. ProjectWise is Black & Veatch's web-based collaboration tool used for document control and project execution. ProjectWise consists of an internal and external component (Intranet server and extranet server) for storage of project-related documents and design data. Since its inception ProjectWise has reduced the time needed to



Our ProjectWise document management system keeps electronic files organized and readily retrievable for efficient work processes.

complete design work and is the document management system being used on all of the Cooper Creek WWTP work completed to date.

Commitment to Quality. Our engineering manager, Nathan White, is responsible for coordinating the overall design and incorporating Black & Veatch's QA/QC policies and practices into the design documents. The industry average for change orders on municipal projects is approximately 5%. Change orders on Black & Veatch projects have consistently been well below the national average at about 1.5%.

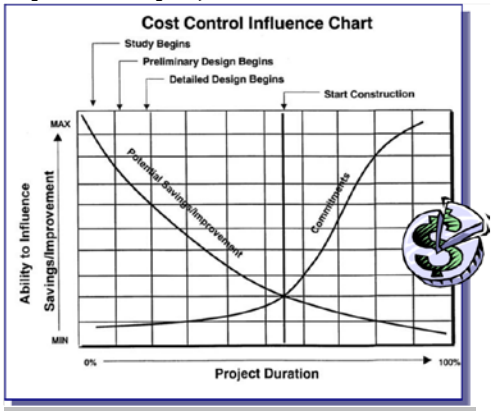
Quality Control Starts with People. The senior technical review team we have devoted to this project will play a key role in ensuring that your quality expectations are achieved. With over 100 years of combined experience with wastewater pump station and treatment facility designs along with pipeline assessment and design, our technical advisory panel will ensure that the designs are reliable and driven by value.

Quality Assurance is a Continuous Process. Quality Assurance (QA) is continuously updated throughout the project with scheduled feedback to the project team. Our process of producing quality deliverables is focused on error prevention and not solely on error checking. QA procedures are established at the start of our projects and included in the Project Management Plan so that team members are on the same page with Water Services Department staff to the fullest extent possible.

COST CONTROL PROCEDURES

Our number one goal for your project is Total Client Satisfaction. This requires the project team's commitment to achieving a quality project on schedule and within your budget guidelines. The following are major activities used by our project team to help ensure your project comes in under budget.

Trend System. The central component of our cost control plan is the trend system. A trend is any activity or change from Attachment A – Scope of Work that affects project cost or schedule. A trend log is started during early planning activities and records new ideas identified by any member of the project team. A trend analysis is then conducted to determine if the trend is to be incorporated into the project. The results of these analyses are recorded on the trend register, which summarizes all analyses and shows their impact to scope, schedule and budget not only from an engineering perspective, but a construction perspective as well.



Early project activities significantly influence costs and facility improvements so QA/QC activities must begin early for the biggest impact to project success.

Engineering Services Cost Control. Your standard monthly progress report will be prepared to compare earned value against project expenditures. We will list in our reports potential variances to our Scope of Services and provide potential order-of-magnitude impacts (both credits and additions). Our project team will work very closely with your staff to define the level of service, material and equipment preferences, available budget and schedule.

BURNS McDONNELL

PROPOSAL FOR ENGINEERING STUDY FOR THE

COMPTON DRIVE WASTEWATER TREATMENT PLANT FLOOD PROTECTION IMPROVEMENTS

SUBMITTED TO

City of Branson | Engineering / Public Works Department

March 11, 2016

March 10, 2016

David Miller, PE
City Engineer
City of Branson
110 W. Maddux, Suite 310
Branson, Missouri 65616

Re: Proposal to Provide Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Miller:

The impacts of Hurricanes Katrina and Sandy have given rise to the risk of flooding to our critical infrastructure on a national level. The large releases from Table Rock Lake in April 2011 and again in December 2015 that buried the city's intake structures and threatened flooding of the Compton Drive Wastewater Treatment Plant have shown that the risks are not just associated with hurricanes.

We understand the City of Branson is looking for an experienced and trusted team to help address the risk of flooding at the Compton Drive Wastewater Treatment Plant. A team with a commitment to client service, great attitude, innovative solutions, who is accountable, accessible, flexible, and promotes smart ideas is needed. **We, at Burns & McDonnell, are that team.**

Leon Staab, PE is our proposed project manager and lead engineer. Leon has more than 26 years of engineering experience in flood protection, stormwater management and civil engineering design. Leon will lead the project with support by staff from the Water Group in our Kansas City, Missouri office. Rachelle Lowe will continue her work with the City of Branson. She and Leon were the core project team for Meadows Water Treatment Plant Intake Structure Improvements dredging projects. We know they will provide you with the same great service that you have come to expect from our engineering teams.

Our team also includes senior engineers with experience in flood protection, wastewater treatment, electrical engineering and structural engineering. We have included their resumes to demonstrate our past experience with similar projects. Their project experience has been abridge due to the page limitations. Should you desire additional information, please let us know.

We appreciate your consideration of our team for your Compton Drive Wastewater Treatment Plant Flood Protection Improvement Study. Should you have any questions or need further clarification on our qualifications, please contact Leon Staab at (816) 822-3214 or lstaab@burnsmcd.com.

Sincerely,

Ron Coker, PE*
Senior Vice President

Leon Staab, PE
Project Manager

**Authorized to sign the submittal response and to commit to its submittal on behalf of the proposer.*

PROJECT APPROACH

INTRODUCTION

The December 2015 flood events in Missouri has brought flooding risk to the forefront of concern for many utilities. Burns & McDonnell recently visited the Grand Glaize wastewater treatment facility in St. Louis, which was flooded in late December 2015. During that flood, two feet of flood water inundated the facility. Motors, wiring chases, motor control centers, and other electrical gear were expose to water and damaged. Having seen the damage firsthand, we understand importance and urgency of this study. The goal would be to achieve an affordable level of protection, or a plan to bring the facility back into service quickly following a flood event.

PROJECT APPROACH

Our team has taken time to visit the site, review existing design drawings for the Compton Plant, review the flood risk, and review the regulatory requirements for flood protection. We have inferred from the request for proposal that cost may be a primary driver for the selection of a level of protection. With this goal in mind, we propose to slightly modify the approach described in the request for proposal to offer the city more flexibility in the decision-making process.

The request for proposal states that the consultant is to determine an appropriate level of protection, and then is to develop design alternatives for either a flood proofing strategy or a flood protection strategy. A value engineering effort would then be complete to identify reduction in costs, and the city would then select from the two strategies. This approach is valid, but limiting. The true assessment of value is with the variation of the level of protection. Cost, risk, affordability and other non-technical considerations must all be considered. We feel that the approach can be modified to afford greater flexibility.

We would approach the entire effort as a value engineering study rather than a study of alternatives. We believe that there is greater value in understanding the relationship between relative costs for a range of levels of protection than there is to understand the detailed costs for a specific level of service. Therefore, our study would culminate into two simple cost curves: one for the flood proofing strategy and another for the flood protection strategy. Cost curves depict risk, cost, and best value in a way that is easily understood. The curves will show where the protection strategies have comparable cost, and which strategy is likely to be most cost effective at a given level of protection.

Added Value

The city controls its own destiny. The request for proposal states that the consultant will decide the appropriate level of protection for the plant. That approach would only give the city two options, and makes the decision based almost entirely on engineering. Our approach provides the city with sufficient data to make an informed decision, and will allow other factors to be considered.

It is a value-based approach. Decisions can be based on all of the criteria that is important to the city – not just a technical analysis. Consider the Fenton, Missouri wastewater treatment facility in Saint Louis. The plant was completely submerged during the December 2015 flood event and remains off line for repairs. While repairs are underway, sewage from the facility is being directly discharged to the Mississippi River without treatment. Now imagine a flood event that inundates the Compton facility that disrupts service for months. Raw sewage would continuously discharge into to Lake Taneycomo. The repercussions would be felt far beyond the cost to cleanup and replace equipment at the treatment plant. Such an event would impact regional tourism, the economic health of the city, and could pose a threat to health and well-being of the general public. The value of flood protection cannot be determined solely on costs associated with the treatment plant.

It saves money. Until the city decides upon a level of protection and a strategy (flood proofing or flood protection), it is premature to complete some the scope items listed in the request for proposal. For example, if the city selects flood proofing as the preferred strategy,

the analysis for a ground water pumping system would not be necessary. If the site is allowed to be inundated, the evaluation of groundwater may not need to be as extensive. The evaluation to raise Compton Drive has more value if the flood protection strategy is selected, and will depend greatly on the level of protection decide. The efforts to analyze the need for a subsurface seepage cutoff and the impacts to the plant during installation only need to be conducted if the city selects the flood protection strategy. It is not our intent to discount these concerns.

Our approach would address these concerns, but at a high level of discussion. The initial consideration would be to determine if any of the concerns constituted a fatal flaw that would eliminate a particular strategy from consideration. We propose to provide a more detailed analyses once a strategy has been determined.

Flood Protection Strategies

We will divide the project into two strategies. One strategy will focus on alternatives that flood proof the existing facility. This set of alternatives will still allow portions of the facility to be inundated with floodwater. However, key pieces of equipment and structures will be protected from water damage, or elevated to specified level of protection. Evaluation of treatment plant facilities would consider critical infrastructure that would be exposed to flooding. The FEMA Flood Insurance shows that the 100-year flood elevation overtops the existing levee system. It also shows that the 500-year flood would completely submerge the facility with the possible exception of the solids handling building and headworks.

The second strategy will investigate a perimeter flood protection system. This system, which will consist of floodwalls, levees and other appearances, will keep the protected area dry during a flood event without the need to elevate or flood proof equipment.

We feel that the two strategies can be evaluated concurrently. Because the flood proofing effort examines the equipment and structures, it can be done by a team of process, structural and electrical engineers. The flood protection effort, which surrounds the site, can be done with a team of civil and structural engineers. The advantage of a dual team approach is the reduction of schedule.

PROJECT MEETINGS

To meet the goals of the project, extensive involvement by city staff is expected. It is proposed that a monthly progress meeting be conducted throughout the duration of the project. Meeting agendas would be developed to include project updates and a discussion of technical issues relating to design. In addition to progress meetings, it is anticipated that special meetings with city stakeholders or other agencies may be necessary throughout the course of the project.

Document Review

We would start the project with an extensive document review. Specifically, we would develop an inventory of all structural, mechanical and electrical assets that are critical to the treatment process. Burns & McDonnell has designed many components of the plant over the years, and can identify the most critical assets. Locations and elevations would be documented to the extent shown on the drawings. Where no elevation data is provided, the asset will be flagged for additional field reconnaissance. We will also verify the elevations of the key structures on the site, and will identify the elevation for which floodwater will inundate the structure. The hydraulic profile drawings of the plant seem to provide a comprehensive inventory, and may be the only information required.

SITE RECONNAISSANCE

The document review processes will be supplemented with field reconnaissance. Our team will spend time at the plant and verify the information found during the document review. The purpose of the field investigation is to fill in the data gaps were possible, and to identify equipment or structures for which surveyed elevations are required. It is our hope that most of the elevation data associated with equipment and structures can be obtained or derived from record drawings. However, if additional information is needed, we would enlist a local surveyor to obtain the missing information.

SELECTION OF KEY FLOOD STAGES

At its core, this study is about risk, and the risk is related to river stage. Currently, there are two flood stages in the Flood Insurance Study that are linked are risk: the 100-year base flood elevation and the 500-year flood elevation. We would select several other key flood elevations to be used in the evaluation. The following table presents our initial thoughts on the flood stages that key to understanding the relationship between risk, cost, and regulatory requirements.

River Stage	Significance
714	The height of the existing flood protection at the site. To relate this elevation to risk, we will need determine the return period for this elevation. This flood stage reflect the risk associated with no action.
716	MDNR's criteria states that the plant must be accessible and operational during a 25-year event. We will need to determine the elevation as part of the study (716 is an approximation)
718	The approximate 100-year, base flood elevation at the site.
725	There is a difference of 19 feet between the 100 and 500-year events. It may not be economically feasible to provide protection for the 500-year event. However, some level of protection above the 100-year may be feasible. Because there is such a difference in elevations, we would select an intermediate stage to improve the accuracy of our cost curve.
737	The approximate 500-year, base flood elevation at the site.

COST EVALUATION OF FLOOD PROOFING

The evaluation to flood proof equipment and structures will consider the key flood stages. As an example, we would start with a flood stage of 716 feet as described in the table above. The elevation of each critical asset (i.e., structure or piece of equipment) identified would be compared to the flood stage. If the asset is above the flood stage, no action is required, and there would be no cost to move the asset. If the asset is below the flood stage a cost to move, modify or protect the asset would be developed.

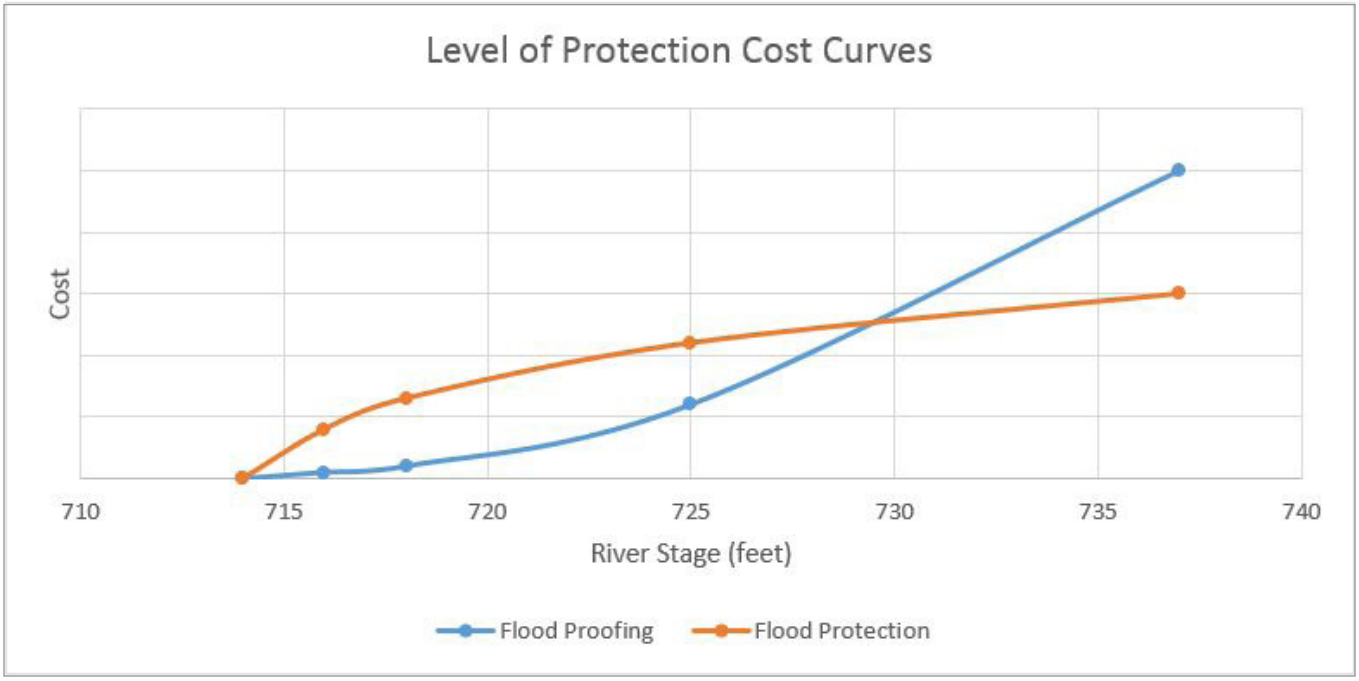
This effort will include a review of the electrical power distribution system. The review will identify the primary distribution equipment, which if damaged or exposed to flood waters, would implicate other facilities and equipment in the downstream process. In addition, electrical equipment will be identified as critical to the treatment process or as supportive of the treatment plant. The elevation of equipment will be taken into consideration as well as the manner in which cabling enters the equipment. Conduit routing between equipment may provide the path for flood waters to breach areas not otherwise at risk. Enclosure types will also be noted, although it would be expected that no existing enclosures are adequately capable of providing protection from sustained submergence from flood water.

The costs to address all assets would be totaled, and the cost for flood proofing to an elevation of 716 would be added to the cost curve. To complete the cost curve and provide costs for wide range of risk, the process would be repeated for the other river stages.

COST EVALUATION FOR FLOOD PROTECTION

The evaluation of flood protection options will be similar to that used for evaluating flood proofing. For each flood stage, a conceptual flood protection strategy will be developed. We expect strategies to vary with stage. For stages within a few feet of 714, there may be adequate room to install and earthen levee. There may be a range of stages for which and earthen levee / floodwall combination provides an effective solution. Finally, there will be a flood stage for which a floodwall the only option for a flood protection strategy.

We understand that flood protection strategy involves more than just a perimeter line of protection. Our analysis will consider the impacts to effluent pump capacity, underground utilities, underseepage, interior drainage, impacts to adjacent and/or upstream properties, raising Compton Drive, etc. At this point in the study effort, it is not the intent to prepare a detailed analyses of the improvement. The goal is to conduct the minimal amount of analysis to formulate a reasonable, conceptual design and develop a budgetary cost.



Evaluation of Cost Curves

The document review, field investigation, and alternatives analyses will culminate into the development of cost curves. As shown in the example figure above, we will take a detailed analysis and refine it to a simple illustration of risk versus cost.

At this point, the city must consider its options and decide on a course of action. That decision will have to take into account more than just the engineering associated with the study. Among other things, the city will need to take into account regulatory requirements, affordability, the lifespan of the plant, potential future modifications, insurance rates, and the consequences of failure. From these curves, you will have a starting point for conversations with city stakeholders. Stakeholders may include City Council members, the City's Risk Manager, Public Works Director, Utilities Director, and the Emergency Management Director. Not all of the stakeholders will have an engineering background with the desire to understand treatment plant operations or floodplain hydraulics, but all will understand that it costs money to reduce risk.

VALUE ENGINEERING

Value is defined as the ratio of function to cost, where function is the ability of the proposed flood protection strategy to protect the plant from flooding (level of protection). Value engineering is a method to improve upon the plan by examining the function. As stated previously, value engineering is not part of our approach – it is the underlying principle of our approach.

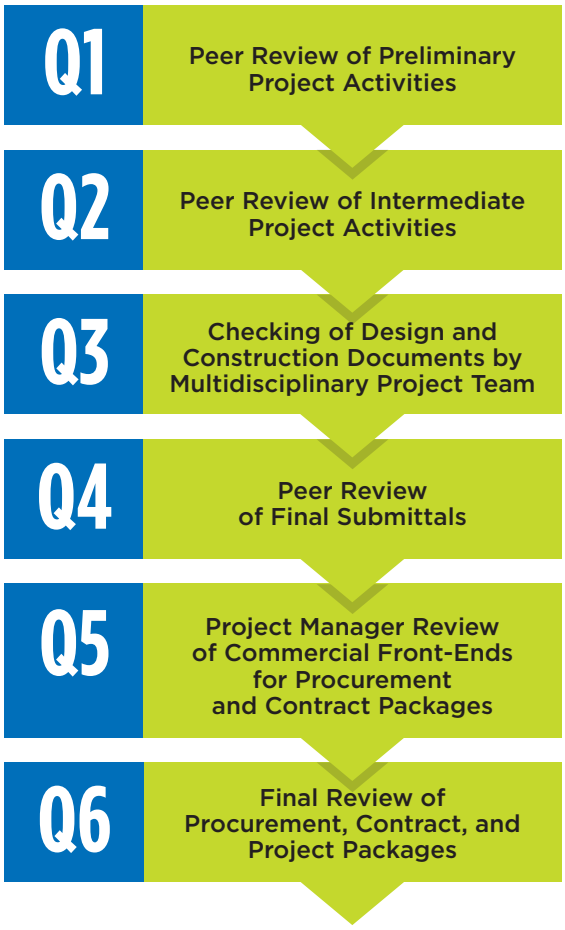
We have focused this project approach on the technical aspects of assessing risk and cost, and how it relates to a protection strategy at the treatment plant. However, we recognize that there are other concerns that the city will need to consider. While we can determine the cost of a level of service, the value is more intangible. Therefore, we propose a meeting(s) with the city stakeholders to identify the all of the benefits of a project, the consequences to the community if the plant were flooded, and the special concerns of each stakeholder. This input will be used to guide the determination of the level of service, and will be documented in the final report.

EVALUATION OF FUNDING SOURCES

We would investigate possible state and federal funding sources that could be used by the City to implement a future project. While the request for qualifications states that the funding applications are to be prepared, we would recommend that this effort be initiated once the project has been identified.

QUALITY ASSURANCE / QUALITY CONTROL

Burns & McDonnell has a tradition of providing complete, consistent and high-quality services to our clients. Our project teams accomplish this through skill and dedication and by following our Quality Assurance/Quality Control (QA/QC) Program.

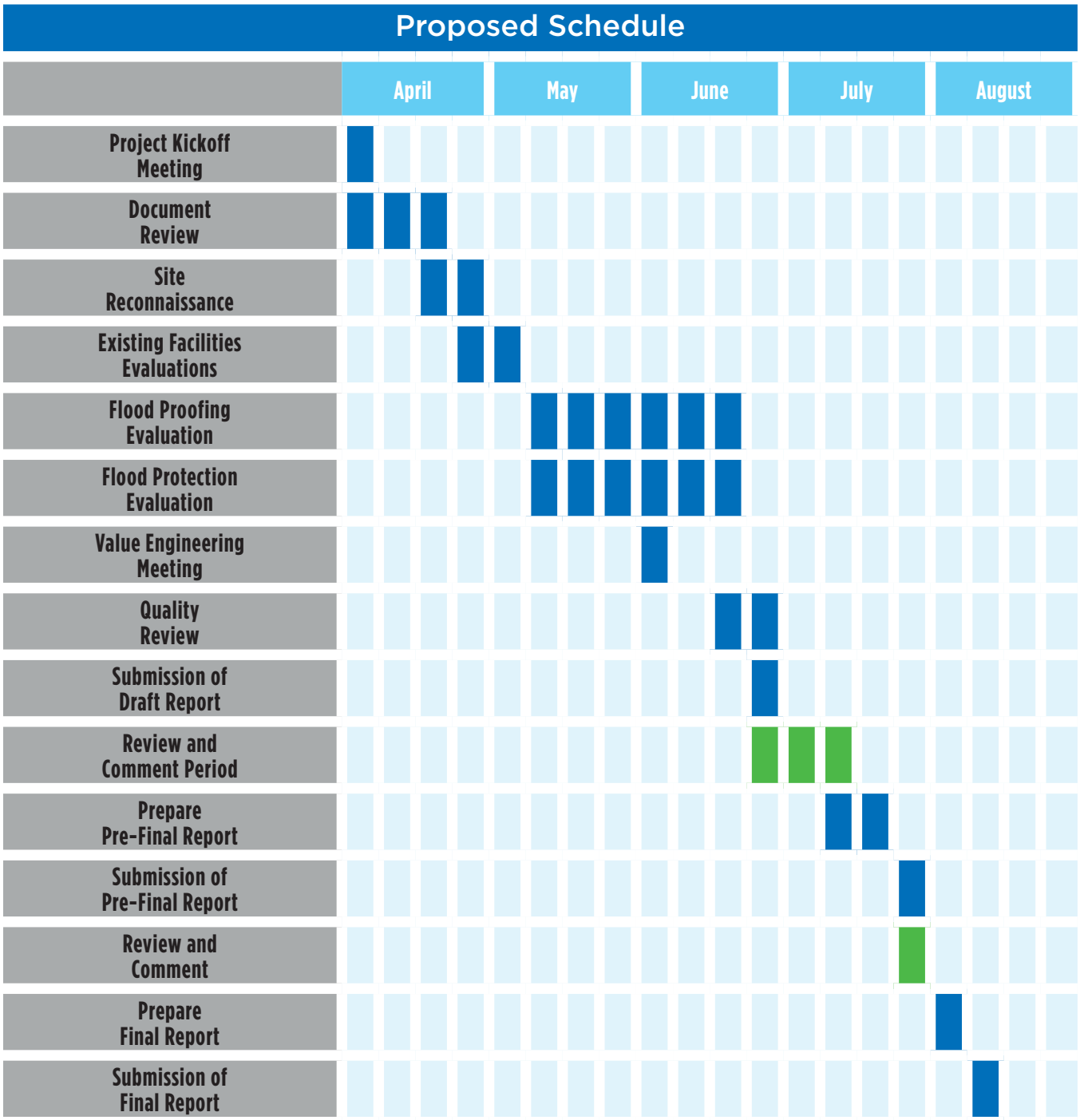


Providing instructions as well as checks and balances, our QA/QC program is based on lessons learned from more than 100 years of successful projects and elements of industry-recognized quality assurance standards and best practices. Our team performs risk reviews to identify, assess and develop plans to mitigate risks and create project instructions, which include scope and responsibilities, schedule and budgets, and project-specific requirements. We build six-step internal quality reviews into project schedules that involve regular coordination meetings and evaluations by experienced professionals at strategic milestones throughout the design and construction processes.

Burns & McDonnell projects often contract externally for supplementary professional services, suppliers of materials and equipment, and construction services. The quality control measures taken for subcontractors typically include prequalifying potential suppliers before bid and award; reviewing shop drawings and other submittal documents; prequalifying potential suppliers for major equipment and shop inspections; conducting a three-phase method of construction quality control; and reviewing and verifying testing records and other records of fabrication and construction.

These methods allow Burns & McDonnell to maximize design, specification and drafting efforts; to comply with codes, standards, laws and regulations; and to help our clients achieve their project goals within the constraints of time, budget and technical feasibility.

PROJECT SCHEDULE



RELEVANT PROJECT EXPERIENCE

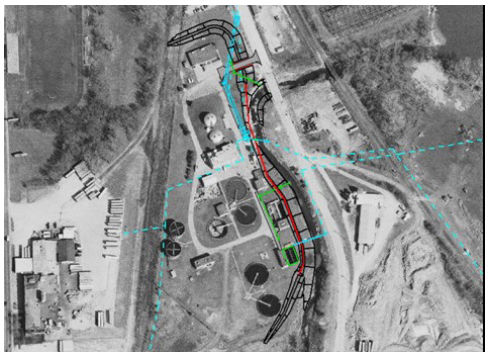
EMPORIA WASTEWATER TREATMENT PLANT IMPROVEMENTS
Emporia, Kansas

As a fully-integrated design-build team, Burns & McDonnell and CAS Constructors are tasked with the planning, design, and construction services for the 4.6-MGD Wastewater Treatment Improvement Project for the City of Emporia, Kansas.

Prior to final selection of the facility upgrades, the Burns & McDonnell team is conducting a full analysis of the impacts of Emporia's Floodplain Management Ordinance, which states that substantially improved critical facilities, including sewer treatment plants, "shall be elevated above the 0.2-percent annual chance flood event." As such, all of the pending improvements, including the proposed integrated fixed-film activated sludge (IFAS) treatment process within the existing activated sludge basin footprint, must be protected from the 500-year flood elevation. A benefit of the flood hazard protection for the City includes continued insurability of the treatment plant assets, which is a factor being assessed by our team via coordination with the Federal Emergency Management Agency (FEMA).

The numerous options currently being evaluated by our team of engineers and constructors range from raising the existing level and/or flood wall around the entire existing facility by 5 to 6 feet to selecting an alternate, higher-elevation location to construct a new wastewater treatment facility. Final selection of the flood mitigation strategy is anticipated for mid-2016 and completion of the facility is estimated for late-2018.

FLOOD PROTECTION AT WASTEWATER TREATMENT PLANT
Leavenworth, Kansas



Burns & McDonnell was hired by the City of Leavenworth to design a flood protection system for the wastewater treatment plant. The system was designed to protect the plant from flood events on the Missouri River and Fivemile Creek. The project involved the design of approximately 2,100 feet of earthen levees and concrete floodwalls. Where space allowed, an earthen levee was designed as the primary means of protection. Because of the proximity of the facility to Fivemile Creek, some areas precluded the use of an earthen levee. Therefore, a floodwall was used. Given the scale and high visibility of the proposed wall, the design included architectural coloring and texturing for aesthetics. The work also included relocation of the plant entrance road; design of an interior drainage system; design of several sluice gate structures; modifications to two existing manhole structures, and relocation of utilities.

DISTRICT ENGINEER SERVICES

North Kansas City Levee District

The North Kansas City Levee District operates and maintains approximately nine miles of the flood protection system along the Missouri River. The system provides flood protection for North Kansas City, Missouri and portions of Kansas City, Missouri. Burns & McDonnell serves as District Engineer and is responsible for review of plans and specifications for work within the critical zone of the levee. The District Engineer is also responsible for conducting levee inspections; design of maintenance projects, implementation of the District's Emergency Preparedness Plan, and liaison with the U.S. Army Corp of Engineers.

ENERGY STRONG AND TRANSMISSION HARDENING STUDIES

New Jersey

Burns & McDonnell is engaged in a number of services for projects related to storm hardening efforts in the State of New Jersey. These projects have involved various facets of a typical project process including preliminary design, development of licensing and permitting packages, detailed engineering, procurement, and construction activities.

Due to the effects of Superstorm Sandy PSE&G began identification of critical assets and installations as well as an evaluation of alternatives for hardening assets and decreasing vulnerability to future flood events. As part of this effort Burns & McDonnell was engaged to perform preliminary analysis of mitigation options and provide study level cost estimates for the options deemed feasible for hardening efforts. These options included the installation of new equipment at increased elevations, raising of critical pieces of existing equipment above require flood elevations, the installation of flood walls or embankments for protection of stations or critical assets and the redesign of existing yards and movement of entire stations to new locations for decreased asset vulnerability. A total of 21 substation studies & cost estimates were completed. Station studies were completed in areas with both tidal and riverine flooding.

COASTAL SUBSTATION FLOOD MITIGATION NEEDS AND CONCEPTUAL SOLUTIONS

New Haven, Connecticut

Burns & McDonnell evaluated UIL Holding's Corporation (UIL) coastal substations at risk of flooding and developed long term mitigating solutions. The final preferred solutions addressed flood exposure risks along with all other relevant infrastructure deficiencies at each substation.

UIL has seven coastal substations at risk of damaging flood conditions and in need of a long term assessment. In the 40+ year history of these substations, UIL had not experienced any disruptive flooding until back to back storm's Irene and Sandy in 2011 and 2012 respectively. Following these two storms, FEMA published revised coastal flood maps showing the predicted 100 year storm levels increasing by 2-4ft along UIL's coastline, well beyond the design withstand levels of these coastal substations.

The recent experiences of these two storms along with the significant FEMA flood map revisions now highlighted UIL's exposure to a single credible flooding event that could simultaneously disrupt multiple coastal substations.

Burns & McDonnell prepared a comprehensive study to determine appropriate long term solution measures in consideration and with collaborative input from state and regional stakeholders. Burns & McDonnell provided the proposed approach to developing and evaluating multiple solutions for each impacted substation including design considerations for the various possible protection levels of FEMA+1, 2, and 3ft. The study included considerations of cost, benefit, and confidence in the description. The possible solutions considered included installation of new equipment at increased elevations, raising critical pieces of existing equipment above the required flood elevation, the installation of floodwalls for protection of stations and the relocation of entire substations to new locations.

KEY PERSONNEL

LEON J. STAAB, PE
Project Manager

Mr. Staab is a senior project manager and engineering manager of the Systems Group at Burns & McDonnell. Leon has more than 26 years of engineering experience in stormwater management, flood protection and civil engineering design. He has extensive experience in civil works and flood control projects, and has served as the district engineer for the North Kansas City Levee District since 1998, lead the certification of effort for the North Kansas City Levee Unit, designed the levee system for Hamburg, Iowa; and was project manager for the design of a flood protection system at Leavenworth's wastewater treatment plan.

General Consulting Services | North Kansas City Levee District
North Kansas City, Missouri | On-going

Fort Peck Dam Spillway Evaluation | U.S. Army Corps of Engineers
Fort Peck Dam, Montana | 2012

Fort Peck Dam Critical Repair Assessment | U.S. Army Corps of Engineers
Fort Peck Dam, Montana | 2012

Levee Certification | North Kansas City Levee District
North Kansas City, Missouri | 2012

Flood Protection Project at Wastewater Treatment Plant | City of Leavenworth
Leavenworth, Kansas | 2004

RACHELLE L. LOWE, PE
Client Coordinator

Rachelle Lowe is a project engineer with experience working on numerous flood control, civil and stormwater projects. Rachelle has a wide range of experience in hydrologic and hydraulic modeling. As project engineer Ms. Lowe has been involved in many different aspects of a project. Ms. Lowe has written studies, completed detailed design, prepared project specifications, and performed construction phase services. Rachelle's experience with flood control project began in 2010 with her work associated with the North Kansas City Levee District. This experience has given her a unique experience the covers design, operation and maintenance of flood control systems.

General Consulting Services, North Kansas City Levee District
North Kansas City, Missouri, On-going

Emergency Flood Response | North Kansas City Levee District
North Kansas City, Missouri | 2011

Water Intake Remediation Study | City of Branson
Lake Taneycomo, Missouri | 2012

Middle Blue River Basin Green Infrastructure and Distributed Storage Improvements | City of Kansas City
Kansas City, Missouri | 2013

STEVE HANSEN, PE, CFM

Flood Protection / Civil Engineer

Steve Hansen is a Senior Civil Engineer with Burns & McDonnell's Water Global Practice, Systems Department. Steve has been involved with the planning, design and project management for a diverse array of projects types involving site layout and design, military facility planning and design, water and sanitary utility planning and design, stormwater facilities and flood mitigation. He has worked on these projects with a diverse clientele from both the public and private sector including energy companies, electric utility companies, defense contractors, Department of Defense (DOD) agencies, US Forest Service, Federal Highway Administration (FHWA), petroleum companies, state department of transportations (DOTs), municipalities and counties

Coastal Substation Flood Mitigation Needs and Conceptual Solutions | Connecticut | United Holdings Corporation
Connecticut | 2015

Energy Strong and Transmission Hardening Studies | Public Service Electric & Gas Company
New Jersey | 2014

Seminole Big Cypress, Basin 4 | US Army Corp of Engineers, Jacksonville District
Hendry County, Florida | 2011

JEFF D. BARNARD, PE

Wastewater Treatment Engineer

Mr. Jeff Barnard, PE. is a senior project manager whose projects include both wastewater collection system and treatment plant design. Jeff has a strong background capital improvements planning for wastewater systems which has included wastewater planning; inflow and infiltration studies; systems modeling; wet weather storage facilities; sewer system evaluation surveys; corrosion evaluation and control; and system rehabilitation.

Facility Plan and Technical Memorandum | City of Kansas City, Missouri Fishing River Wastewater Treatment Plant
Kansas City, Missouri | 2010

Kansas Big Bull Design Build Wastewater Treatment Plant | City of Edgerton
Edgerton | Kansas 2012

Fishing River Wastewater Treatment Plant Improvements | City of Kansas City
Kansas City, Missouri | 2011

Wastewater Treatment Plant Improvements | City of Trenton
Trenton, Missouri | 2008

Wastewater Treatment Plant Improvements | City of Harrisonville
Harrisonville, Missouri | 2009

Wastewater Treatment Plant City of Ava
Ava, Missouri | 2003

CRAIG M. KOENIG, PE

Electrical Wastewater Engineer

Mr. Koenig serves as a project manager and lead electrical engineer for projects which include the planning, detailed design and construction of municipal water treatment, commercial, and industrial facilities. Craig has provided all aspects of electrical systems design from concept development through start up for new facilities as well as upgrades and expansions to existing facilities. His project management experience includes multidiscipline studies and design projects for municipal utilities and government agencies as well as contracts with multiple task orders.

Broad Creek Wastewater Pump Station | Washington Suburban Sanitary Commission
Laurel, Maryland

Vulnerability Assessment and Development of Wastewater Infrastructure Enhancements
Chattanooga, Tennessee

East Bottoms Pump Station Rehabilitation and Expansion
Kansas City, Missouri

Knoxville Utilities Board
Knoxville, Tennessee

JOHN TSOUFLIAS, PE

Structural Engineer

Mr. Tsouflias is a member of the structural department in the Water Group. He has several years of experience the design of structures for water and wastewater treatment facilities, for both public and private clients. Mr. Tsouflias' experience involves the analysis, design, specification, and structural evaluation of water and wastewater treatment facilities, industrial facilities, and special structures. His experience includes the design of concrete, steel, and masonry structures, complete structural design of buildings, shallow and deep foundations, above and below grade water containing structures, equipment supports and foundations, pipe racks and bridges, and mezzanines and platforms.

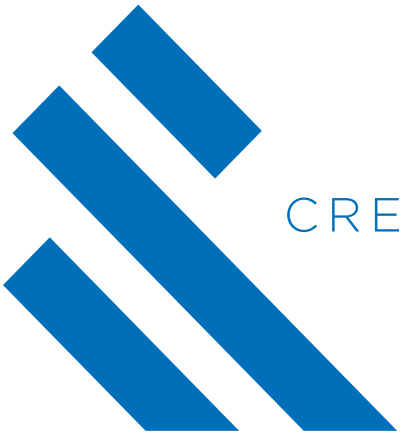
Coastal Substation Flood Mitigation Needs and Conceptual Solutions | Connecticut | United Holdings Corporation
Connecticut | 2015

Energy Strong and Transmission Hardening Studies | Public Service Electric & Gas Company
New Jersey | 2014

Duckett Creek Wastewater Treatment Plant | Duckett Creek Sanitary District
St. Peters,Missouri | 2015

Wastewater Treatment Plant Improvement Construction Phase Services | Little Blue Valley Sewerage District
Independence, Missouri | 2013

Wastewater Treatment Plant at Distribution Facility | Confidential Client
Cheyenne, Wyoming | 2013



CREATE AMAZING.

9400 Ward Parkway
Kansas City, MO 64114
burnsmcd.com

Proposal for Professional Engineering Services

Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements

City of Branson, Missouri

March 11, 2016

HDR

March 11, 2016

David Miller, City Engineer
City of Branson
110 W. Maddox, Suite 310
Branson, MO 65616

RE: Professional Engineering Services
Compton Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Miller,

The flooding in December of 2015 was truly record-breaking and eclipsed the peaks set in 2008 and 2011. The Compton Wastewater Treatment Plant was inches from being inundated. Flooding this critical public infrastructure asset would have sustained millions of dollars in damages and subjected downstream areas to potentially untreated wastewater flows. Ultimately this potential disaster could have a potential long-lasting impact on the recreation and tourism industry in Branson.

HDR commits its resources, experience, and expertise to a unique solution for the City of Branson. Three central and vitally important themes to our approach are as follows:

- Enhance resiliency by identifying the best approach using industry-leading tools. Enhancing the resiliency of critical infrastructure to better withstand flooding and to more readily recover from these events adds to a community's overall resiliency to disaster. We will evaluate multiple alternatives to resiliency including wet flood proofing plant elements compared to levee improvements. HDR will then evaluate risk trade offs and incorporate value engineering using our patented **Cost Risk Assessment and Value Engineering (CRAVE) process** to balance costs and benefits.
- Position Branson for successful Federal funding. The greatest improvement plan is ultimately worthless if it cannot be implemented due to funding shortfalls. Our team of engineers and economists will use a Benefit-Cost Analysis (BCA) to select the optimal recommendation. This thoughtful analysis will include a number of key aspects in addition to initial costs, such as climate uncertainty, plant operational losses, implementation schedule and tourism impacts. By optimizing project costs and benefits, Branson will be well-positioned for federal funding that typically prioritizes based on these measures.
- Avoid adverse impacts to homes and businesses. Since the wastewater plant is located outside of the floodway, FEMA floodplain standards typically allow for slight increases in flood elevations. However, we would propose a No Adverse Impact (NAI) approach to flood mitigation due to the large number of homes and other development in the immediate vicinity, many of which have already experienced flooding. This approach will fully consider and mitigate increases in flood stages, velocities, erosion, sedimentation, and other effects. Our project manager has developed NAI designs for other projects on Lake Taneycomo and is the best suited to find ways to mitigate flooding impacts that may result from protecting the plant.

HDR commits a tailored team that stands ready to guide the development of a comprehensive flood mitigation strategy to enhance resiliency of your critical infrastructure. ***Eric Dove*** will manage this important project. He has proven able to find Lake Taneycomo floodplain solutions for the City under tremendous scrutiny and assisted MoDOT with the new Hwy 76 Bridge. In addition, Eric Dove has already

worked on the Compton Influent Pump Station wet flood proofing. We are coupling Eric with national experts that have tested and refined our approach based on our nearly identical work at the wastewater treatment plants in the Iowa communities of Cedar Rapids, Des Moines, Blair, and Sullivan's Island to name a few. ***Ron Sova,*** who was key to solving the flood challenges of these plants, is a key member of our proposed Branson Team. All of these HDR projects involved FEMA funding, flood risk reduction, levees and plant improvements.

This project is too important to leave it to chance. Branson needs a proven process with experts that truly understand, appreciate and care about solving this potential flood and economic hardship for the betterment of the City and its citizens.

Sincerely,

HDR Engineering, Inc.

Stan Christopher, PE
Senior Vice President

Eric Dove, PE
Project Manager

2139 E Primrose, Suite E, Springfield, MO 65804-4589
(417) 351-6500

1.0

Business Organization & Technical Approach

Text

Business Organization

We are proud to call Missouri our home.

HDR is a part of every community where we work, especially here in southwest Missouri. We are honored to have designed flood protection systems throughout the region that protect our communities. We know the local business, culture, requirements and regulations in Missouri so we can anticipate challenges and quickly solve problems to make the experience seamless for you. Our Missouri offices include Springfield, Forsyth, Columbia, Lee's Summit, Kansas City, and St. Louis. HDR has had an office in Springfield since 1989. Our local staff of 14 lives and works in the community and understands what is important in southwest Missouri.

Principal-in-Charge:
John Denlinger PE, CFM
4435 Main Street, Suite 1000
Kansas City, MO 64111
D 816.360.2740
C 816.674.2741
john.denlinger@hdrinc.com

Office Location and Project Manager:
Eric Dove, PE
2139 E. Primrose, Suite E
Springfield, MO 65804
D 417.351.6502
C 417.894.9015
eric.dove@hdrinc.com

Palmerton & Parrish Contact:
Rachel Goeke, PE
4168 W. Kearney Street
Springfield, MO 65803
D 417.864.6000
C 417.830.0329
rachelgoeke@ppimo.com

Technical Approach and Scope of Work

We appreciate the detailed scope provided in the RFP and in order to save space we have not recreated it herein. We have highlighted a few of the key elements and offer the following additional clarifications of our approach.

CRAVE – Industry-Leading Tool to Optimize Branson's Solution

HDR's proprietary Cost Risk Analysis and Value Engineering (CRAVE™) process is a vital tool to identify, quantify and rank project risk factors through a cost and risk analysis. Much of the CRAVE inputs will be developed in a workshop with City staff that have intimate understanding of the Plant's operation, past flood fighting experience, and a detailed knowledge of the City's operations. In addition, the sustainability coordinator and economic development director will be invited to give a more holistic view point including the potential tourism impacts. Your talents when combined with HDR's experts can systematically work through each of the project elements identifying costs and risks. By having a clear understanding of the project component costs and the risks that each component alleviates, CRAVE illuminates the components of high-value and clarifies the decision process.

HDR's CRAVE process is fully customizable to meet your specific needs

The process can be scaled to be as simplistic or detailed as desired to support project decision-making.

The CRAVE process will include looking at the wet flood proofing of the plant to different flood protection elevations, the costs associated with each level, the operational impacts and the risk residual. On the levee, we will look at the interim protection as well as the 50, 100 and 500-year protection levels. Within each level of protection there will be sub-sets of risk such as addressing the seepage rates under the levee. One approach might reduce the under seepage rate in half to make sure the levee is structurally sound and then rely on pumps for the remainder of the interior levee protection. These costs and risks can be weighed against a more substantial under seepage cutoff wall.

Value is at the heart of the CRAVE process and HDR has proven itself to be indispensable in working through these items. Value engineering unfortunately is typically used as a means to make last-minute scope reductions or incorporate lower-cost materials to meet budget requirements. We view this as a missed opportunity. Instead of trying to create value at the end of a project, our approach is to create value from the start through our CRAVE™ process. This procedure has won numerous awards for most improved value engineering process, an American Council of Engineering Companies Grand Award, and a Seven Wonders of Engineering Award from the Minnesota Professional Engineers Association. With CRAVE, HDR's VE Team Leaders go far beyond traditional problem identification strategies, providing innovative solutions to your toughest project challenges—often on an accelerated schedule.

Wastewater Treatment Plant Retrofits Evaluation

One alternative to constructing a higher berm or flood wall is to modify the existing flood prone items within the plant. HDR will complete a survey of the existing structures to verify record drawing elevations. The as-built plans will be reviewed to identify the existing levee penetrations and utilities that may impact the feasibility of the alternatives. The elevations will be compared to flood elevations to determine any structures that require modifications. Additional on-site visual inspections will be completed to identify all equipment, controls, structures, etc. that will require modifications to minimize flood damage. Modifications may include raising sidewalls on structures, raising equipment, installing water-tight vaults to house equipment, among other possibilities.

HDR is uniquely qualified with wet flood proofing and wastewater experts available locally.

The 100-year flood elevation at the site is approximately 719 ft. msl where as the ground on the inside of the plant is about 704 ft. msl and the top of the existing levee is approximately 715 ft. msl. This means that many of the electrical panels and concrete side walls may need to be elevated 5 to 7 feet. This may include constructing a catwalk system to provide access during flood events. Building modifications may also be required to prevent flooding of the lab. The style of construction of the lab building will allow approximately 4 feet of water to pond against it before the structural capacity of the walls becomes questionable. Either a new structural wall will be needed around the building or the building elevated to prevent damage from the 100-year flood event. These options will be evaluated for feasibility. An opinion of probable construction costs and life cycle costs to make these modifications will also be provided. On January 30, 2015, President Obama issued Executive Order 13690 that revises Executive Order 11988 and proposes a new Federal Flood Risk Management Standard. It requires any projects involving federal funding be built to the 500-year flood elevation for critical buildings or structures. To this point, the Missouri Department of Natural Resources has not adopted this requirement, but it may be a requirement in the future.

Compton WWTP

An additional element of the wastewater evaluation is considerations of operating prior, during, and following flood events. Under these conditions, there will be a wet weather surge within the collection system, the influent pump station may be completely submerged, the check valves into the concrete structures could allow inflow and the final pump may not be able to discharge the increase in flow over the levee. We will evaluate if the plant could potentially become overloaded and flood the inside of the levee. With proper preparation and operations, flood damages to the plant will be minimized and plant can recovery much quicker.

We understand the City has committed to the neighborhood that the plant will not be expanded in the future. It may be prudent however to perform an initial evaluation if the filter should be replaced with a more efficient system that is able to meet upcoming nutrient and ammonia limits. The evaluation will be used to identify space requirements such that

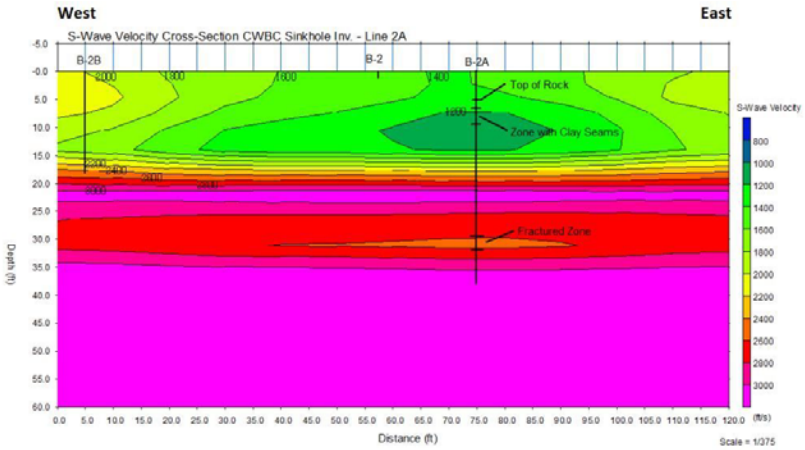
the ring levee situated to allow for the treatment improvements. Our wastewater experts can help evaluate the needs and space requirements as we have for dozens of clients across the country.

Geotechnical Investigation

Our team provides Branson with a thorough understanding of the unique site geology which is critical for project success.

Past experience has shown a substantial amount of water seeps either through or under the levee and threatens to flood the plant from the inside. In addition, dewatering during construction resulted in subsidence and damage to yard piping. In the 2011 flood the existing levee was raised, but vibrations from the construction equipment could be felt along the levee leading to questions if the levee is structurally sound. After reviewing the as-built plans, there is approximately 27 feet of soft floodplain deposits below the treatment plant. The deposits are likely layered with gravel and clay deposits. Below the floodplain deposits is limestone bedrock that could be highly pinnacled and contain karst with nearly horizontal bedding planes. The combination of floodplain deposits and karst bedrock could allow a substantial amount of water to flow under the levee and flood the plant. In order to address this concern, we propose a two-stage geotechnical investigation. The first stage will be limited and focused on supplying adequate information for the CRAVE analysis. The first stage will be completion of a geophysical survey of the perimeter levee embankment. A combination of multi-channel analysis of surface waves (MASW) and seismic refraction geophysical survey methods will be utilized to characterize the condition of the subsurface conditions beneath the perimeter containment levee. Geophysical survey data will provide information regarding shear wave velocity, including extremely soft zones, indications of highly pinnacled bedrock, and indications of large voids if present. The picture below shows a MASW Survey Profile from a sinkhole evaluation project in Springfield, along with a confirmatory boring stick log.

If the levee option is chosen, then a second more detailed geotechnical investigation can be performed to meet FEMA Levee Certification Standards. This approach lessens the initial effort in the event the levee improvement is not deemed the best approach.



Our geotechnical investigation teaming partner, Palmerton & Parrish (PPI), will use data from the geophysical survey to select apparent "worst case locations" for subsurface drilling. **PPI will select subsurface boring locations to collect data for completion of levee slope stability and underseepage analysis. Selected boring locations will be converted to piezometers upon completion of drilling, and the remaining borings will be backfilled with high solids bentonite grout.**

Underseepage Evaluation

The first step in underseepage analysis will be gaining a complete understanding and inventory of existing wells, riser pipes, manholes, drains, and historic observations at the plant. We will use the existing dewatering wells to perform a pump test and determine aquifer properties. Additional piezometers and monitoring wells will be installed to measure the groundwater response to the pumping. The pump test will help us evaluate the magnitude of water that may seep under the levee, determine if additional relief wells would be useful, and if there are highly permeable zones under the plant that connect to Taneycomo. Palmerton & Parrish staff that live close to the site will be able to man the pump test cost effectively. This low-cost approach of developing the groundwater transmissibility study by using the on-site resources will be a valuable tool to evaluate a large number of alternatives and help us to better understand the sub-surface risks. The boring logs, pump tests, transmissibility findings and laboratory data will be summarized in a geotechnical evaluation report.

After reviewing the geotechnical information and data collected, HDR will look at potential seepage cutoff methods including sheet pile, secant pile wall, and cement-bentonite walls, among others. One risk we will evaluate is if

operating the dewatering wells during a flood fight could potentially induce settlement within the plant and lead to yard piping and other damages.

Analysis of Climate Variability

In 1995 the USACE completed a $65 million dollar improvement to Table Rock Dam that allows them to discharge more water in order to avoid overtopping the dam. This also resulted in the 100-year flood elevations on Taneycomo Lake to increase 6 feet. The increase in flooding you are experiencing could be due to a climate shift, but could also be in part due to the operational changes made in Table Rock Dam. In order to better understand our risks for an increase in future 100-year flood depths, we propose to perform a climate variability analysis.

HDR's climate experts will help Branson assess the potential impacts of more frequent and intense storm events and the risks associated with climate uncertainty.

The National Climate Assessment (2014) states that "several types of extreme weather events have already increased in frequency and/or intensity due to climate change, and further increases are projected". Flooding risks associated with these changes in climate variability can be quantified and incorporated into design planning to enable this facility to be resilient to current threats and to threats that may become more extreme in the years to come. HDR's hydro-meteorological team will perform a hydrologic risk analysis for this facility that will include:

- A data-driven historic perspective of the observational changes in precipitation and water flow in the watershed above the facility (including naturalized flow data from before the construction of Table Rock Dam (1954-1958) and Beaver Dam (1960-1966).
- An analysis of Table Rock Dam rule curves and historic releases in correlation with extreme rainfall events within the watershed. This will include contributions to the White River (Lake Taneycomo) between the dam and the facility (i.e. Turkey Creek and Roark Creek).

Once a historic baseline for what is currently possible is set, an analysis using Global Climate Model downscaled projections (CMIP5) and site-specific modeling available through the University of Missouri Climate Center will be applied to make determinations of the risk presented by projected changes in precipitation/flow volumes in the region.

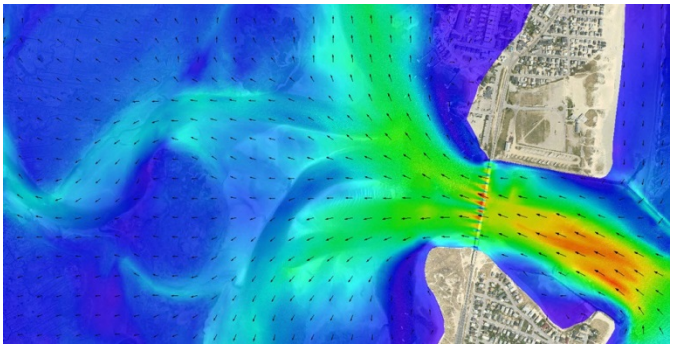
A report detailing the perspective between current risk/threat of extreme precipitation/runoff events versus the evaluation of how these risks/threats are expected to change over time. Although time scales for these evaluations can be decided at a later date, 2025, 2040, and 2060 are recommended. The additional flood risk from potential climate variability will be added to our benefit cost analysis and will help inform the CRAVE process.

Hydraulic Modeling

The FEMA model was updated following the construction of Branson Landing. Our project manager has personal experience using the model and supplied information and analysis used in the most recent updates of the hydraulic model. The updated floodplain model will be utilized as a starting point to evaluate the hydraulic impacts of raising Compton Drive, constructing a ring levee or flood proofing the plant. Additional topographic information in the vicinity of the plant will be added based on the 2-foot GIS contours available and based on our topographic survey of the plant site. Since there are numerous homes in the floodplain, a key goal of the modeling will be to demonstrate No Adverse Impact associated with flood risk management concepts. There are several options that can be evaluated to mitigate any induced rise such as vegetation management and minor grade changes along the banks of the slough on the north side of the plant. HDR recommends the use of a two-dimensional floodplain hydraulic model. The floodplain will be split with part of the flows going around the treatment plant to the north and the rest will stay on the river side. The typical flood plain model is one-dimensional (HEC-RAS 1-D) and will not take into account the flow direction changes and nuances associated with this split flow. A two-dimensional model is needed to fully evaluate the effects of raising Compton Drive, the ring levee construction, and the dynamics of a slough.

HDR will use cutting-edge hydraulic modeling tools to evaluate flooding scenarios and provide Branson with confident results.

HDR is the industry leader in providing two-dimensional hydraulic modeling to local and federal government. As an Alpha and Beta Tester, HDR influenced the development of HEC-RAS 2D and was consulted about the technical accuracy of the model and the user interface. More than any other private consultant, HDR has modeled hundreds of stream miles and dozens of levee projects to evaluate a No Adverse Impact. The modeling is far more than an academic exercise and leads to a more robust design. HDR's experience allows you to be confident the project will perform well during the flood and not negatively impact adjoining properties.



An element that is frequently overlooked is stormwater management on the inside of the levee under both normal and flood conditions. If the ring levee option moves forward, then there will be a need to drain stormwater from the inside of the levee. Although a pump can be used, this is the more expensive option to both install and operate, so ultimately this would not improve the resiliency of community due to the financial burden. A culvert under the levee is a better long-term solution and will gravity drain the stormwater rather than using pumps. A closure structure will be installed on the culvert to automatically close when Lake Taneycomo reaches flood stage. The operation and maintenance manual for the plant will be updated to cover the wastewater treatment plant operations, including stormwater and groundwater management, for these conditions. By being prepared with a plan, we will minimize the damages and quickly restore the plant to full operational status.

Interim Flood Protection

HDR has a dedicated team of professionals that provide Emergency Management Services (EMS). In nearly 100 years of client service we have contributed EMS on these event types:

- Domestic terrorism
- Drought
- Earthquake
- Flooding
- Hurricane
- Ice storm
- Infrastructure failures
- Landslides
- Public health
- Spills and releases
- Tornado
- Tsunami/coastal surge
- Wildfire
- Winter Storm

Specific to flood fights and flood recovery efforts, we assisted communities after Super Storm Sandy, Hurricane Katrina, Estes Park flooding and active flood fight assistance for multiple communities impacted by the historic Missouri River flooding in the Dakota's, Nebraska, Iowa and Missouri. HDR assisted BNSF and UPRR during the December 2015 flood fight with active meteorological and flood stage updates along their systems in Missouri. Being shoulder to shoulder during these flood fights has taught us valuable lessons on interim flood protection measures that work and ones that don't live up to the claims. In addition, knowing the likely modes of failure allows us to focus on the key features and implement protective measures. HDR will identify useful interim flood protection measures that a limited City staff will be able to implement within the warning time typically provided by the Little Rock District. The flood protection measures will be documented in a Flood Emergency Action Plan that will identify the materials, equipment, and manpower needed to install and man the interim flood protection measures.

Funding Evaluation

HDR has worked with a variety of Federal funding sources such as Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP), FEMA Pre-Disaster Mitigation (PDM), FEMA Flood Mitigation Assistance (FMA), Community Development Block Grant Disaster Recovery (CDBG-DR), United States Army Corps of Engineers

HDR will balance costs with benefits to provide an optimal solution that has the greatest opportunity for Federal funding.

(USACE), Environmental Protection Agency and Clean Water Act State Revolving Funds (EPACWA-SRF), United States Department of Agriculture Natural Resources Conservation Service (NRCS), just to name a few. The ring levee projects around the wastewater treatment plants in Des Moines and Cedar Rapids were both funded through FEMA HMGP grants which HDR helped prepare. HDR also completed the FEMA HMGP application for the wastewater flood proofing at Sullivan's Island which is currently being reviewed. The flooding in December 2015 prompted Presidential Disaster Declaration 4250 (PD-4250) and will provide an estimated $8 million in funding. Branson is included in the communities that are eligible to receive funding. In addition, the prior flooding in June 2015 also received a presidential disaster declaration. Of the total funding, 7% is held aside for mitigation planning projects. We believe this study would be a perfect candidate for this funding and a Notice of Intent (NOI) is due by the end of March for PD 4250. We have discussed potential funding with Missouri SEMA and have already laid the ground work if you choose to go this route.

The federal funding sources have a lot of similar elements and generally reference similar guidance documents. Central to these programs is developing a benefit-to-cost ratio. The benefits are calculated as damages that would have occurred if the project was not implemented. The benefits include the averted direct impact to the treatment plant but also can include averting potential fines from EPA and averting recreational and tourism impacts to Lake Taneycomo. Our economist, ***Jeremy Cook***, has already prepared similar calculations in the Ozarks as part of the Springfield integrated plan. Jeremy has also assisted in the prior HMGP applications and well versed with specific programs required such as FEMA's HAZUS and BCAR.

HDR has also assisted on a USACE Little Rock District funded project in Springfield that involved a 50% cost share between the local sponsor and the Federal Government. Our work included developing the hydraulic models, hydrology models, coordinating the project development and assisting with economic model. HDR has an on-call type of contract with the USACE that could be accessed to work on this project under a cost share agreement with the Federal Government and we can discuss this funding option with you.

2.0

Project Team

Project Team

The HDR team brings great strength with both local and national expertise in flood protection. With HDR and PPI offices in Springfield, we can be on site quickly and be responsive during all phases of the project, as has been demonstrated during our previous work. The HDR and PPI team members identified for your project were selected based on their capabilities and expertise and for their availability to effectively work on this project for its duration.

HDR & PPI have worked closely together on previous projects. PPI will provide the outstanding geotechnical drilling and analysis services you have become accustomed to.

Our team was built for your success.

We have assembled a tailored, multi-disciplinary team to accomplish the project goals. Our project manager, ***Eric Dove***, has extensive experience on the White River Floodplain including Branson Landing wet flood proofing, hydraulic modeling leading to FEMA remapping Taneycomo, and hydraulic modeling for MoDOT during the design of the new Hwy 76 Bridge. Mr. Dove assisted Branson Landing during the 2011 flooding and fully understands the relationship between Table Rock Dam and the major tributaries such as Turkey Creek and Roark Creek. In addition to his local experience, Mr. Dove has worked on several levee projects prior to joining HDR.

Roger Less will be our lead technical advisor. In April 2015, Roger retired as the Chief of the Design Branch for the USACE-Rock Island District where he had served for 31 years. Through his career Roger has been involved in flood protection projects across the Midwest including extensive design and rehabilitation work on levees. His insight and hands-on experience from performing levee design, flood fights and rehabilitation will be a vital component to a successful project.

Travis Heier assisted by ***Pat Young*** will lead the wastewater treatment plant flood proofing evaluation. Travis and Pat have been working closely with Mike Ray on the biosolids drying project. Travis works out of our Forsyth office and his proximity and knowledge of the City's wastewater system will be valuable as we evaluate the equipment that may need to relocated and elevated.

Bob Beduhn and ***Blane Long*** will lead our CRAVE process. They are certified value specialists and have extensive experience on helping communities across the country identify and implement flood risk reduction strategies. They will facilitate our efforts to find a fundable, transparent and optimal solution. ***Jeremy Cook*** our economist will also be a key person during the CRAVE development. He has extensive benefit-to-cost-analysis projects including those performed on wastewater treatment plant flood risk reductions that were used to apply for FEMA funding. We have assembled brief resumes for a few of our key staff members.

Eric Dove, PE

Project Manager

Mr. Dove has 26 years of experience which includes a wide variety of water resources endeavors. He has been a team leader, project manager, design engineer, and lead modeler for flood control, water supply and recreational dams, fisheries improvement, dredging, detention ponds, water quality improvement, wetland mitigation, FEMA mapping, breach analysis, benefit-cost analysis, watershed protection plans and stream restoration designs. Mr. Dove has also provided IDIQ services to the USACE Omaha District and has an extensive modeling background.

John Denlinger, PE, CFM

Project Principal

Mr. Denlinger serves as Water Resources Section Manager and as a Senior Water Resources Engineer. He has over 25 years of total experience specific to water resources engineering and planning. He is experienced in flood risk management, feasibility studies, federal agency coordination, and project implementation. As Project Principal, he will assure that Eric and the team have the resources needed to exceed your expectations.

Roger Less, PE, CFM

Senior Technical Advisor/QA-QC

Mr. Less is a Senior Water Resources Project Manager, responsible for project management, business development, client relations, technical advice and project reviews for water resources projects throughout HDR. Mr. Less has 37 years of experience, 31 years with the US Army Corps of Engineers and 6 years with state water resources agency.

Ron Sova, PE

Senior Technical Advisor/QA-QC

Over the last 15 years, Ron has proven his ability to work collaboratively with clients to implement solutions focused on their needs. His engineering experience includes anaerobic and aerobic treatment systems, industrial pretreatment systems, solids dewatering and disposal, odor control, stormwater projects, and water supply, treatment and distribution. Ron will be available to provide technical guidance to exceed your expectations from concept development through construction and start-up.

Bob Beduhn, PE

Senior Technical Advisor/QA-QC

Mr. Beduhn is a senior vice president with extensive experience in the water resources field. As HDR's director of the Dams, Levees, and Civil Works practice, his responsibilities include staffing and technical quality of HDR's technical programs in these subject areas. He coordinates a team of regional directors, technical advisors and practice group leaders in subjects ranging from dams and hydraulic structures, levees, flood risk management, hydrology and hydraulics, water quality, atmospheric science, ecosystem restoration, stream geomorphology, coastal engineering and restoration and fisheries science and design.

Travis Heier, PE

Plant Resiliency

Mr. Heier has experience working as a project manager in wastewater, water resources, solid waste, development, and environmental engineering. He has served as project manager on multiple interceptor projects and specializes in construction administration. He has served in a construction administration role on multiple projects with budgets of over $5 million.

Patrick Young, PE, ENV SP

Plant Resiliency

Mr. Young is experienced in wastewater collection and treatment projects. He has 20 years of experience in all phases of wastewater facility design with an emphasis on process design. His broad based knowledge of treatment technologies and corresponding operational nuances provide numerous benefits to our clients.

David Wiseman, PE

Structural Engineering

Mr. Wisemans experience includes all aspects of structural design and interdiscipline coordination on water and wastewater treatment projects. He has used his field experience in structural retrofit and repair projects to review engineering plans for constructability and consistency. His structural design experience includes masonry, light-gauge and rolled steel structural systems and many concrete structures; foundations, basins, pump stations, dams, frames and walls.

Jeremy Cook

Economic Sustainability

Mr. Cook has experience in economic and statistical modeling and fiscal analysis for various state, federal, and other public sector organizations. As an Economist with HDR, he has: performed analysis of costs and benefits of various water resources and transportation related projects; developed cash flow models and finance alternatives for public infrastructure; analyzed the economic impacts of various water resource and transportation related projects in multiple states throughout central and western U.S.; performed market analysis of construction materials; and assisted with the development of optimization model.

Patrick Poepsel, PE

Geotechnical Engineering

Patrick has been involved in the geotechnical aspects of transportation projects as a project manager, designer, peer reviewer, and construction observer. His experience covers the analysis, design, and construction of deep foundations for bridges and offshore piers, retaining walls, pavements, building structures, embankment fills, zoned earth dams, flood control levees, management of field and laboratory investigations, and the preparation of geotechnical reports, project specifications, construction plans, and cost estimates.

Scott Brand, PE

Geotechnical Engineering

Mr. Brand is a geotechnical engineer and specializes in dams, levees and flood control projects. His responsibilities include design analyses of concrete gravity, RCC and earth dams, levees, dam inspections, preparation of detailed drawings, evaluation of soil data for geotechnical analyses, seepage and slope stability analyses of existing embankments, preparation of technical specifications, and performance of geotechnical subsurface investigations.

Andy McCoy, PhD, PE

Hydraulics & Hydrology

Dr. Andrew McCoy is a senior water resources engineer and numerical modeler, with more than 13 years of experience using computational hydraulics to complete evaluations involving flood inundation, river hydraulics, channel restoration and stability, and water/wastewater facilities. He is a recognized expert in solving civil engineering problems with numerical modeling, and he has also authored peer-reviewed journal articles and conference proceedings in these areas.

Blane Long, CVT, CCT

CRAVE Workshop

Blane is a Certified Value Specialist (CVS) and a Certified Cost Technician (CCT) with over 30 years of experience providing innovative project management, value engineering (VE), risk assessment/ management and training improvements to enhance projects of all sizes. Blane has been a leader in integrating other tools and processes to customize the VE process to meet the needs of the project. One such process combines the proven tools of a cost risk assessment (CRA) workshop with those of a VE study. CRAVE, as it is now called, is used to accelerate project delivery as well as minimize and mitigate quantified risks. Blane's ability to bring innovative and cost effective tools such as risk assessment to the VE process has been recognized by several AASHTO awards.

J.B. Neethling, PhD, PE

Plant Resiliency

Dr. Neethling is considered HDR's top wastewater process engineer, with more than 38 years of wastewater engineering experience ranging from master planning, process evaluation, and modeling to design and startup of wastewater treatment plants. He is the lead process engineer for HDR's largest and most complex wastewater treatment plant projects nationwide. He has specialized expertise in nutrient removal and has been involved in more than 75 biological nutrient removal (BNR) projects nationwide. He is also experienced in evaluating system capacity and bottlenecks, and in developing alternatives for improvements that save costs and produces effective and efficient results.

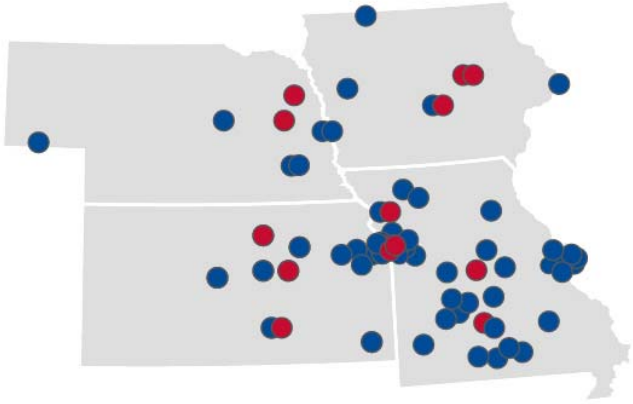
3.0

Related Technical Experience

Related Technical Experience

The map below highlights HDR's extensive experience in delivering successful flood risk management and wastewater treatment plant projects throughout the region. This experience is further complemented by Eric Dove's experience during his 26-year career, which included design projects throughout Missouri. , Nebraska, Kansas, and Iowa.

Descriptions of several key projects provided on the following pages further illustrate our team's ability to identify and determine the risk of flooding, and provide planning, design, and construction services for these complex flood protection projects.



Regional WWTP and Flood Risk Management Projects

***WWTP** (blue) **Levee** (red)*

Water Reclamation Facility Flood Protection Improvements

Des Moines Water Reclamation Authority, *Des Moines, IA*

Reference: Scott Hutchens, PE, WRA Director, 3000 Vandalia Road, Des Moines, IA 50317, 515.323.8031

The Des Moines Metropolitan Wastewater Reclamation Authority (WRA) operates a regional wastewater collection system and a central wastewater reclamation facility (WRF) that provides treatment services to seventeen member Central Iowa communities with a total population of approximately 500,000. The WRF has a treatment capacity of 200 million gallons per day and is located on the banks of the Des Moines River. Even though the WRF has an existing Federal flood risk management levee system providing a level of protection to the facility and other adjacent upstream and downstream areas of the City of Des Moines; the WRA recognizes the critical infrastructure services that the facility provides and desires to provide for additional flood resiliency. The WRF Flood Improvements project includes a holistic approach in identifying WRF flood vulnerabilities for providing uninterrupted service, assess risks, and make risk-informed decisions on the prioritization of improvements within a comprehensive project plan that aligns with the available funding. Alternatives range from revised WRF processes to elevating key equipment to improved levee protection from both interior and exterior sources of flooding including a variety of upstream and downstream levee breach scenarios. Selected improvements will then proceed to preliminary and final design. The associated floodplain and environmental investigations and regulatory permits will also be coordinated as part of the project.

Sullivan's Island Levee

Sullivan's Island, SC

Reference: Greg Gress, Manager, Water & Sewer Department, Sullivan's Island, 843-883-5748

The Town of Sullivan's Island (Town) has a population of approximately 2,000 (including both residents and visitors) and is located on the Charleston Harbor. The Town purchases drinking water from the Charleston Water System, but treats its own wastewater at the Sullivan's Island WWTP. The WWTP is located within a 100-year floodplain according to the current Flood Insurance Rate Map (FIRM), and many structures in the WWTP are even below the 10-year flood elevation (8.9 ft.). Thus, there is a significant risk of flooding. It is also less than 25 miles from the Middleton Place-Summerville Seismic Zone, putting it at significant risk for earthquake damage.

The purpose of this study is to determine the improvements necessary to protect the WWTP from risk of flooding during a 100-year flood event, as defined by FEMA, as well as from the risk of earthquake damage during a seismic event. The intent is to raise the elevations of structures and protective walls to prevent overtopping during a 100-year flood event, and to design new structures to meet current seismic code. However, two alternative options (do nothing, and pump all wastewater to a different WWTP elsewhere) will also be considered. A conceptual design of the most viable option will be presented. The proposed option will limit damage during a storm or earthquake event and allow the plant to remain operational and provide service.

A benefit cost analysis (BCA) has been performed by HDR to support a FEMA Hazard Mitigation Grant Application to obtain federal funds for a flood hazard mitigation project located on Sullivan's Island, South Carolina. The mitigation

funds will be used to fund necessary improvements to the Wastewater Treatment Plant to prevent damages to buildings and equipment, and further prevent any costs associated with the loss of plant functionality during a flood. Improvements include the elevation and flood proofing of the facility for still water flood elevations up to the 100-year flood event.

The BCA utilized the FEMA BCA toolkit to estimate the present value stream of expected annual benefits and costs of the Sullivan's Island Wastewater Treatment Plant Improvements over a project life of 50 years. All values were updated to current value as needed, and adjusted to present value using OMB discount rates (OMB Circular A-94).

Benefits considered in the analysis include: avoided structure damage, avoided loss of service, avoided damages to facility contents and equipment, avoided cleanup costs, and avoided hauling and treating costs.

Tomahawk Creek Wastewater Treatment Plant Improvements

Johnson County Wastewater, *Johnson County, KS*

Reference: Susan Pekarek, Johnson County Wastewater, 11811 S. Sunset Drive, Ste. 2500, Olathe, KS 66061, 913.715.8543

The Tomahawk Creek Wastewater Treatment Plant is located in the City of Leawood, KS collects and treats wastewater from portions of Leawood, Olathe, Overland Park, and Prairie Village. The WWTP has been modified numerous times since its original construction in 1955. Major improvements are currently being planned for the facility to better serve the surrounding communities and in response to new discharge limitations.

The WWTP is located at the confluence of Indian Creek and Tomahawk Creek, with the entire facility being situated within the FEMA regulatory floodplain and floodway. Surrounding development, long-established transportation routes, park systems, and wetland areas create further challenges for WWTP expansion.

HDR's approach to this challenging site was to strike the right balance between the WWTP facility improvements, floodplain management requirements, and environmental permitting. The WWTP facilities will need to be raised with earthen fill material above flood elevations, which alone would cause a rise in the floodplain elevations and impacts to surrounding development. Through detailed hydrologic and hydraulic modeling, HDR was able to develop a flood mitigation plan to achieve No Adverse Impact conditions and cause no increases in floodplain elevations. This mitigation plan includes the development of an "overflow channel" along a remnant slough of the original Indian Creek channel. The plan also provides stormwater management measures including bioretention areas to capture and treat the water quality volume.

Flood Protection Design at the Cedar Rapids Water Pollution Control Facility

City of Cedar Rapids, *Cedar Rapids, IA*

Reference: Roy Hesemann, WPCF Utility Plant Manager, City of Cedar Rapids, 1111 Shave Road NE, Cedar Rapids, IA 52402, 319.286.5972

Completed CRWPCF Flood Protection System

On the heels of devastating damage estimated at up to $70 million from record flooding in June 2008, the City of Cedar Rapids turned to HDR for a plan to protect the Cedar Rapids Water Pollution Control Facility (CRWPCF). HDR worked closely with utilities staff to develop the plan, assisted with development of a Flood Response Plan for interim use by CRWPCF staff until the recommended facilities were constructed, and worked closely with the City's FEMA consultant to maximize emergency management funding eligibility. **The plan included the following primary components to protect against damage from a similar magnitude event:**

- **A combination earthen berm and flood wall around the southern 2/3 of the CRWPCF to prevent riverine flooding.**
- **Modifications to isolate influent and effluent piping, and plant return sewer, stormwater, and effluent pump stations to prevent internal flooding.**

The recommended facilities were prioritized based on the level of protection provided, and the plant return sewer, because of its critical nature, was accelerated to the design stage in parallel with Study completion. Recommendations in the 2009 Study were reviewed collaboratively with the City of Cedar Rapids to consider options, affirm, and refine recommendations to provide the basis for Preliminary and Final Design. Design concepts were refined through workshops with the City and field investigations.

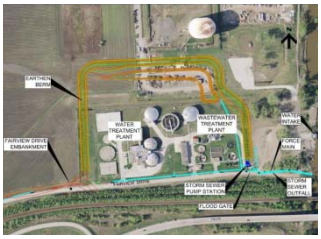
HDR designed an earthen berm and concrete floodwall to provide overall protection from the Cedar River. The berm and wall protect the CRWPCF from flooding comparable to the June 2008 flood and was aligned to provide additional space for future plant treatment needs. The 5,000 LF barrier includes approximately 1,250 LF of concrete floodwall. The existing drainage ditch on the east side of the site was rerouted to follow along the outside of the berm to the existing drainage culvert. Stormwater and plant effluent pump stations were incorporated as part of the flood wall.

To meet funding constraints, the project needed to be completed in 30 months. Concept refinement and field investigations were completed in three months, and preliminary and final design were completed in eight months. The project was split into separate pump station and floodwall/berm packages which were advertised and bid sequentially. Construction bids for the two packages were $10.1 million and 5.8 million, respectively, comparing favorably to HDR's opinions of cost of $12.0 and $7.5 million, respectively.

Blair Disaster Mitigation

City of Blair, *Blair, NE*

Reference: Al Schoemaker, Public Works Director, City of Blair, 341 Grant Street, Blair, NE 68008, 402.426.6695



The water and wastewater treatment plants for the City of Blair, Nebraska, are located on a common campus located adjacent to the Missouri River. In 2011, the City was forced to construct extensive temporary flood protection measures to protect the water and wastewater treatment plants during the Missouri River Flood. The flood waters remained above flood stage for 100 days and caused $6.5 million in damages and flood fighting costs to keep the plants operational. The flood fight exposed vulnerabilities at the plant sites that created significant risks to operations including the loss of access to the plants, gravity outfalls that could not be isolated, lack of back-up power for the intake structure, sanitary trunk sewers that could not be isolated, and extensive seepage due to soil conditions without a storm water removal system that threatened to flood both plants.

HDR worked with the City to recommend improvements that allow the City to maintain operation of the facilities during future high water events with minimal impact on plant operations:

- **Construct 2,900 LF of earthen berm to provide permanent flood protection for the site containing the WTP and WWTP. The earthen berm was constructed on existing City property. This work included a connection to the UPRR embankment.**
- Construct back-up power for both facilities.
- Construct pump station, collection piping, detention pond, outfall storm sewer, force main sewer, and diversion structure.
- New outfall sewers to the river.
- **Several existing utilities needed to be relocated, including 6-inch and 20-inch water mains and a 18-inch sanitary sewer that were within the Fairview Drive right-of-way, and fiber optic and natural gas utilities.**
- An automatic flood gate was installed across the access road that provides protection for the plants during high river events while providing public access to the river during normal river flows. The installed systems are automated to allow personnel to close and open sluice gates, raise the flood gate, and remotely place the pump station in service from the water treatment plant control room.

4.0

Past Record of Performance

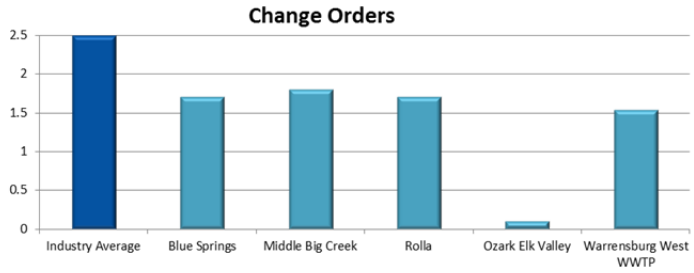
HDR Will Bring It's Performance in Design Quality, Cost Estimating, and Budget/Schedule Control to the City for a Successful Project

HDR specializes in guiding complex projects and solving whatever challenges may arise for its clients in the public and private sector. While HDR's services have evolved to meet increasingly complex challenges ranging from nanotechnology to infrastructure security, one thing that hasn't changed is commitment to the values upon which HDR was founded. These values include respect, integrity, empowerment, innovation, teamwork and responsibility. HDR's mission is to be a superior professional firm known for vision, value and service to our clients, our communities and employees.

Past Performance Record

A measure of design quality is contractor-generated change orders.

Through our comprehensive quality control system, our incident of construction related change orders fall well below the industry average in this area. The chart entitled Change Orders illustrates this point. We believe that our projects have benefited from our quality control system as they have had a low level of contractor generated change orders.

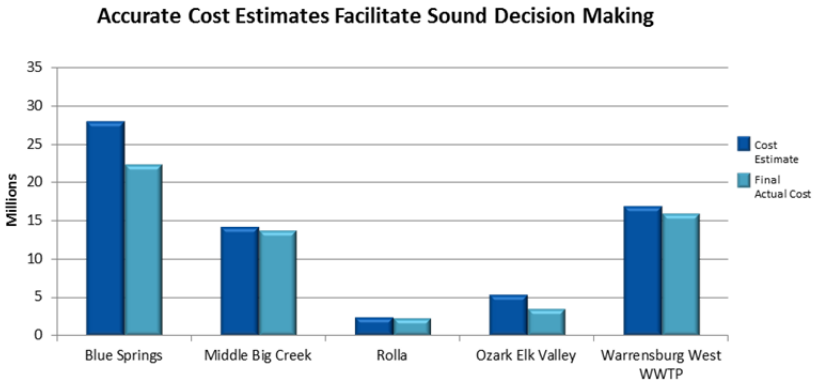


At the beginning of the project we schedule review meetings for all key phases with the appropriate review agencies. This assures the project review remains on schedule and results in "no surprises" from the regulatory agencies at the end of design. Using this method we have been able to "fast track" and "guide" approvals through the various review agencies and expedite the review time.

We are committed to meeting project specific deadlines as well as all other deadlines associated with regulatory agencies, funding agencies, and in meeting promises made to your voters.

Accuracy of Cost Estimates

HDR prides itself in the accuracy of our cost estimates, the quality of our construction documents, and meeting project schedules. An example of several recent projects showing our planning estimate versus the actual cost is shown in the chart entitled Accurate Cost Estimates Facilitate Sound Decision Making.



Accurate cost estimates are of primary importance in today's current market of spiraling costs. We develop detailed cost estimates in our planning stage to ensure this accuracy. We work to minimize the fees expended to develop realistic cost estimates for our clients. We believe it is critical for the client to have the necessary accurate information to make informed decisions.

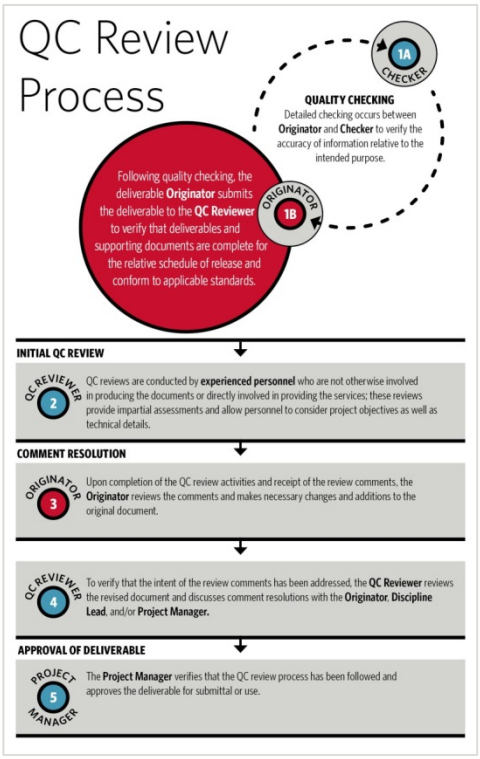
Cost and Schedule Control

The execution of the project on schedule and on budget is critical to the project's success. The project schedule will be monitored and controlled through the establishment of milestones for all activities. Critical path items are clearly conveyed to the City to aid in avoiding delays.

5.0

Quality Assurance/ Quality Control

Quality Assurance/Quality Control



Our Policy. Consistently provide professional services that satisfy statutory and regulatory requirements and that meet or exceed your expectations.

Our Goal. Set the industry benchmark for excellence in the services we provide.

Your project calls for a high level of accountability, and you will find that our attention to detail and adherence to standards lead to successful outcomes. To achieve quality in our work, we have developed a Quality Management System (QMS) based on the fundamental principles and guidelines set forth by the ISO 9001:2008 series of international standards for quality management.

Our QMS provides an important framework for ensuring that we are reaching the highest levels of quality—both for you and for ourselves. We remain focused on continual opportunities for improvement throughout our daily activities to achieve client satisfaction and meet performance expectations. The QMS includes programs, policies, and business processes, and has four key elements:

- **Management Responsibility**. Management actively promotes quality in our business activities and defines responsibilities for maintaining our focus on quality.
- **Resource Management**. Resources are trained, available, and committed to providing quality services.
- **Professional Service Delivery**. Processes and procedures are in place that promote quality in the delivery of our products and services.
- **Measurement, Analysis, and Improvement**. Continual improvement is achieved through performance measurement and identification of areas for improvement.

Our culture of continual improvement provides our clients with confidence that products and services are delivered efficiently and effectively. Our Quality Management System (QMS) components focused on these areas include:

- **QMS Internal Audit.** Provides internal monitoring of local office compliance with corporate quality procedures.
- **Client Report Cards.** Conducted by an independent organization to capture the "voice of our customers."

Preventive action is covered through the following HDR procedures:

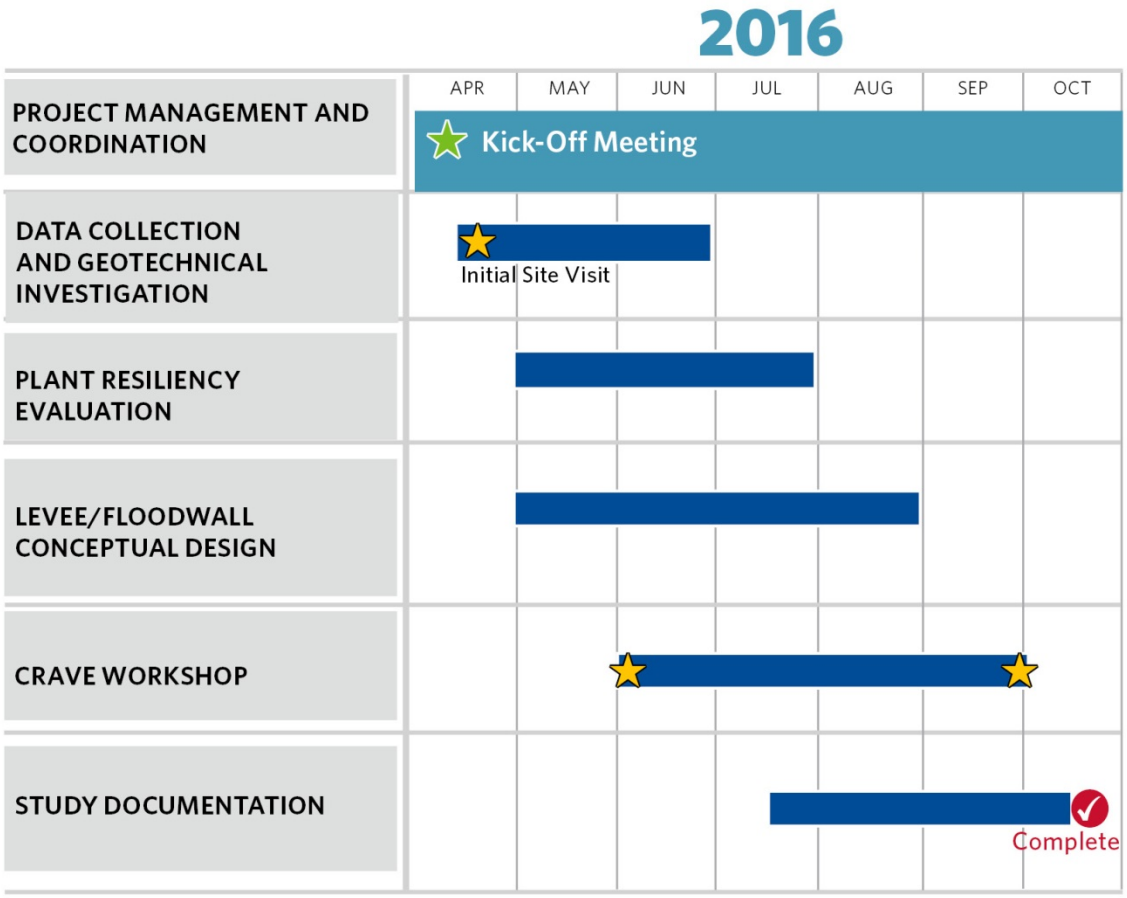
- **Risk Assessments.** Managing risk occurs from the time that an opportunity is recognized through project close-out.
- **Proposal and Contract Review (PCR).** A PCR is conducted to verify that appropriate HDR managers have reviewed and approved the commitment to perform services for a client.
- **Project Planning.** Project planning is essential for efficiently and effectively executing a project and minimizing client and HDR risks.
- **Quality Management Plan.** Planning appropriately for quality activities is essential in maintaining a high level of consistency in the delivery of quality products to our clients.
- **0% Review.** A 0% Review verifies that contractual, business, and management issues have been adequately prepared and the project has been properly planned.
- **Project Approach and Resource Review (PARR).** The PARR is intended to provide the project team with an independent review of project technical concepts, key understandings, and potential project risks. The review results in a summary of key findings and recommendations to the project team.
- **Project Review.** A Project Review facilitates communication between our Project Managers and HDR's management on the status of a contract or project. This review provides an opportunity to identify areas where action may be required to improve project performance.
- **QC Review.** Our QC Review activity includes verification that QC Reviewer comments have been addressed. The QC Reviewer and/or discipline lead reviews the revised document and discusses comment resolutions with the originator, discipline lead, and/or Project Manager.

6.0

Timely Project Completion

Timely Project Completion

The HDR team has the resources and capacity to meet the City's schedule goals for this project which includes study completion by fall 2016. The members of our team were carefully selected both for their expertise and for their availability to commit to this project and they will devote the time necessary to complete this project on schedule. HDR has tailored the project team to provide the high level of expertise, availability, local involvement, and proven ability to work with the City of Branson and the permitting agencies to meet design schedules and project timeline requirements. A proposed schedule is shown graphically below.



2139 E. Primrose, Suite E
Springfield, MO 65804
417.351.6500

hdrinc.com

We practice increased use of sustainable materials and reduction of material use.

Statement of Qualifications:

Engineering Study for Compton Drive Wastewater Treatment Plant Flood Protection Improvements

Horner & Shifrin, Inc.










March 11, 2016

HORNER SHIFRIN

4166 W. KEARNEY ST.
SPRINGFIELD, MO 65803
(417) 865-7000 • FAX: (417) 865-7003
www.HornerShifrin.com

ENGINEERING SERVICES PROPOSAL
ENGINEERING STUDY FOR THE COMPTON DRIVE
WASTEWATER TREATMENT PLANT FLOOD PROTECTION IMPROVEMENTS

March 11, 2016

Mr. David H Miller, P.E.
City Engineer
City of Branson
110 W. Maddux, Suite 310
Branson, MO 65616

Dear Mr. Miller and Members of the Selection Committee:

H&S is proud to offer a uniquely qualified team to Branson for this Flood Protection Engineering Study.

Our project manager Karen Frederick, PE has extensive experience in flood protection, levee construction and levee management issues. Her long association with major levee districts indicate the value she brings to a detailed investigation and speak to her track record of client satisfaction.

The complex geotechnical issues to be considered allowed H&S to bring together two long term partners in a collaborative effort. The key local knowledge and direct on-site experience provided by Palmerton & Parrish will guarantee the team's initial focus will be on look forward issues. The complex under seepage evaluation will the responsibility of Shannon & Wilson. Our teaming relationships with Shannon & Wilson encompass over 20 years of successful collaboration. Each of the three team members have worked together on multiple past projects and as a three team collaborative in the past.

Rozell Surveying & Engineering will provide surveying services. They have worked with the City on numerous projects, and they bring flood elevation experience in the Branson area to our project team.

Our Springfield office staff liaison Rick Todd will ensure a quick response to any issues and provide the communication bridge to the full team during on site activities.

We look forward to providing the technical alternatives and commendations to for Branson to obtain a successful project delivery.

EXPERIENCE ON SIMILAR PROJECTS
HORNER & SHIFRIN, INC.
HOWARD BEND LEVEE DISTRICT | MARYLAND HEIGHTS, MO

Horner & Shifrin has provided engineering services to the Howard Bend Levee District since 1987 when the firm aided in the initial formation of the district, which lies adjacent to the Missouri River in St. Louis County. Following the flood of 1993, Horner & Shifrin developed plans for upgrading from an agricultural levee to a major urban levee. Various levee alternatives were evaluated with respect to both environmental and cost considerations and permitting issues were addressed. Horner & Shifrin worked with a geotechnical firm for evaluation of geotechnical conditions and design of the levee section, relief well system and under-seepage berms. Floodwalls were also included at several locations. Projects performed for Howard Bend Levee District include the following:

- **Levee and Berm System**
  Developed construction bid documents for 500-year levee and underseepage berm system. Levee system is 7 miles in length, along the Missouri River. Ten bid packages ranged in cost from $500,000 to $3,500,000 totaling in excess of $7.5 million. Managed construction contracts, approved payment applications and reported to the District Board of Supervisors.
- **Interior Drainage Stormwater Model**
  Development a stormwater model of 6,000 acres of bottomland. The total size of the tributary watershed is 42 square miles. The stormwater model was used as a tool to obtain a Letter of Map Revision (LOMR) from FEMA as well as a planning tool for future flood protection works.
- **Flank Levee Improvements – North Creve Coeur Creek**
  Development of construction plans for Flank Levees Improvements along Creve Coeur Creek. Obtained permits from the City of Maryland Heights, St. Louis County and Corps of Engineers. The one-mile flank levee improvements protect 1,400 acres from flooding by levee overtopping.
- **Flank Levee Improvements – South Creve Coeur Creek and Fee Fee Creek**
  Development of construction plans for Flank Levees Improvements along south Creve Coeur Creek and Fee Fee Creek. Obtained permits from the City of Maryland Heights, St. Louis County and Corps of Engineers. The 3.5 miles of flank levees will contain the 100-year rainfall event from the 42 square mile tributary area.

- **New River Outlet Design**
  Layout and design of new gravity outlet to convey stormwater for large-flow, small return-frequency storm events. The four-barrel, 12 x 10 ft, 200-ft long culvert has two backflow prevention devices incorporated into the design to prevent backflow from the Missouri River during a major river flood. The 500-year river levee was relocated as part of this work.
- **Regulatory Compliance Activities**
  Worked with Corps of Engineers to upgrade participation level in the PL84-99 program. This program is a cost-share program, which pays 80% of repair costs of a levee failure with Corps funds; the balance is paid by the levee district. Obtained 404 permits when creek bank repairs are required, and obtained other clarifications to maintain compliance with environmental laws (such as tree removal from riverside of levee).
- **Stormwater Modeling Optimization**
  Stormwater-modeling task in which a subconsultant was asked to create an optimizer computer program to maximize stormwater conveyance and storage, and minimize costs and land area consumption.
- **River Model-Floodway Depiction on DFIRMs**
  Modification of the methodology used by FEMA to determine the limits of the floodway, using the HEC-RAS model from the preliminary DFIRMs. This effort was limited to the reach of the Missouri River from a point downstream of I-370 to a point near Bonhomme Creek (including Earth City, Riverport, and Howard Bend levee districts). This resulted in a successful effort to have FEMA show the floodways at the locations calculated by a model instead of the policy location at the landside toe of the levee.

FLOOD PROTECTION AND INTERIOR DRAINAGE | EARTH CITY LEVEE DISTRICT – EARTH CITY, MO

Earth City, a complex commercial and industrial development, is located on the east bank of the Missouri River opposite the City of St. Charles and 27 miles west of the confluence of the Missouri and Mississippi Rivers. Horner & Shifrin was responsible for the design of the levee as part of overall site development services. Designed in accordance with U.S. Army Corps of Engineers standards, Earth City is protected from flooding by a 500-year levee.

The area protected by the front and flank levees encompasses approximately 1,865 acres, of which nearly 1,400 acres lie within the confines of Earth City. Roughly 544 acres of hill area is contiguous to Earth City on the east and drains through it.

In the design of the interior drainage system, nine integrated lakes – which also enhance the aesthetics of the development – minimize the pumping required during periods of blocked drainage as well as to reduce drainage channel sizes. Under blocked drainage conditions, runoff is stored in the lakes and upper drainage channel for later release at controlled rates to the lower channel and pumping station. A pumping station was constructed at the front levee, with a total installed capacity of 150 cubic feet per second (cfs).

The system of lakes, channels, washouts, gates and pumps was modeled with a computer program capable of simulating multiple-reservoir, two directional flows. The program was the first model of its kind anywhere, and was developed specifically to handle this complex system.

During the then-record flood of 1973, the new levee stood the test. Twenty years later, during the prolonged, severe flooding of 1993, the levee system and interior drainage protected Earth City during the entire flood period, which was the longest period the Missouri River has been above flood stage in recent history.

In 1999, Horner & Shifrin designed a major upgrade and enhancement to the primary outlet structure. Using the original triple 10-ft by 12-ft outlet structure, one culvert was converted to provide an additional 100 cfs of pumping capacity with a diesel pump, independent of power feeds to the original pumps.

The gravity operation of the remaining two culverts was upgraded with re-built roller gates and new actuators.

At one of the culverts, a weir was constructed to allow the lake levels to be maintained without the need for periodic pumping

PALMERTON & PARRISH

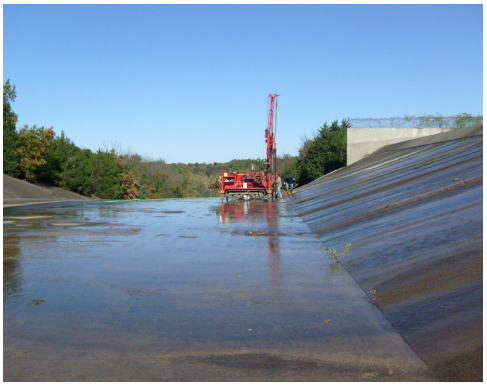
BRANSON LANDING DEVELOPMENT – HCW, LLC

Palmerton & Parrish, Inc. was the Geotechnical Engineer and Materials Testing Laboratory for the Branson Landing Development in Branson, Missouri. Palmerton & Parrish's services were provided under contract to HCW, LLC. The Branson Landing is a $300 million retail, condominium, and convention center development along Lake Taneycomo.

Some of Palmerton & Parrish's first involvement on the project was assistance with design and construction of a retaining wall to raise the elevation of the retail and condominium building sites above the flood plain elevation. The retaining wall was 2,000 feet long and typically about 14 feet tall. A sea wall was constructed in shallow water to allow construction of a lakefront boardwalk. Palmerton & Parrish assisted the project team in design of foundation stabilization for the retaining wall and sea wall in lieu of more expensive deep foundation support. The foundation stabilization was achieved using layers of large size stone reinforced with layers of Tensar BX1300 Geogrid.

Other services Palmerton & Parrish provided for the project included geotechnical subsurface investigation for various structures in the project; pre-drilling of drilling pier foundations to set pier bottom elevations prior to construction; drilled pier inspection; inspection of reinforcing steel; concrete sampling and testing; footing inspection; proof-rolling; field density testing of aggregate base, soil, and pavement; inspection of steel welds and bolted connections; design of deadman anchors for floating structures; and on-call geotechnical engineering services during construction.

FELLOWS LAKE SPILLWAY REPAIR – CITY UTILITIES OF SPRINGFIELD



Palmerton & Parrish, Inc. has had a Master Services Agreement with City Utilities of Springfield for geotechnical engineering and materials testing services since 1993. Palmerton & Parrish, Inc. regularly provides geotechnical subsurface investigations for City Utilities for proposed new projects, and for expansion of existing facilities. Palmerton & Parrish, Inc. frequently provides engineering consultation regarding karst geology, including remediation of sinkhole features which impact City Utilities facilities and/or utility alignments. During project construction, Palmerton & Parrish, Inc. commonly provides materials testing services including observation of proof-rolling, subgrade inspection, inspection of reinforcing steel, concrete sampling and testing, and observation and testing of specialty subcontractor work items such as anchor bolts.

Palmerton & Parrish also provides engineering design services for City Utilities, having most recently completed design plans for the Fellows Lake Spillway Repair. Located in northern Greene County, Fellows Lake is the primary water supply reservoir for the City of Springfield and surrounding area. Fellows Lake has a single spillway outlet structure, which overtops into an approximately 1,200-foot long concrete lined chute. The concrete lined chute incurred multiple slab failures and significant slab damage subsequent to massive flooding during the spring and early summer of 2008.

Palmerton & Parrish was retained by City Utilities of Springfield to investigate the condition of the existing slab, perform a subsurface investigation within the spillway chute, determine probable causes of the concrete slab damage, and complete the engineering design for the spillway repair. Palmerton & Parrish's field studies included concrete coring and soil sampling immediately beneath the existing slab, completion of subsurface borings extending 10 to 30 feet into bedrock, topographic surveying, and detailed field reconnaissance. Laboratory services included soil testing, and compressive strength testing of concrete and rock core samples.

Final design was completed in May 2009. Construction commenced in August 2009 and is currently ongoing. The awarded design alternate included removal and replacement of the most critical 300 feet of spillway slab, installation of a toe drain along the entire 1200-foot length of the spillway, and installation of a series of cutoff walls and drains in the area of the slab replacement.

SHANNON & WILSON

HOWARD BEND LEVEE SYSTEM | MARYLAND HEIGHTS, MO

Completed and ongoing improvements to the Howard Bend Levee System. This approximately 6-mile levee system was extensively damaged in the flood of 1993. Current plans call for the levee to be improved to resist a 500-year flood event. S&W's duties included determination of the drilling, laboratory, and analysis scope; technical oversight of the drilling and laboratory testing; performing seepage, stability, and settlement analyses for the proposed levee; and management of the 9-plus year project.

URBAN LEVEE EVALUATION, CALIFORNIA DEPARTMENT OF WATER RESOURCES, STOCKTON, CA

Geotechnical levee investigation including identifying specific cone penetrometer test and soil boring locations, marking the locations for public utility clearance, and coordination of field meetings for access and utility clearance. Specific soils investigation tasks included the drilling and sampling of nine soil borings (hollow-stem and mud-rotary drilling); and classifying continuous soil samples and preparing descriptive field logs.

MISSOURI BOTTOMS LEVEE SYSTEM, HAZELWOOD, MO

Preliminary explorations and engineering evaluation of the existing and proposed flood protection system. The total system length would be approximately 7 miles with protection provided to the 500-year event.

U.S. ARMY CORPS OF ENGINEERS, SAINT LOUIS DISTRICT, WOOD RIVER LEVEE, EAST ALTON, IL

Collection of 33 4-inch-diameter concrete cores from the existing floodwall. Cores were collected both vertically and horizontally with a maximum core length of 4 feet. Select cores were then examined to identify the aggregate condition and original source.

MONARCH LEVEE SYSTEM, CHESTERFIELD, MO

Evaluation of pump station related erosion following construction of four new pump stations. Specific duties included evaluation of the observed scour and development of appropriate stabilization methods.

BATTELLE, CENTER HILL DAM, IEPR SAFETY ASSURANCE REVIEW, TN

Independent external peer review panel to review the Supplemental Major Rehabilitation Evaluation Report for Center Hill Dam, Caney Fork River, Dekalb County, TN. Project was listed as a DSAC 1 dam at the time of the review due to multiple failure modes mostly, but not exclusively driven by karst features. Project elements include a barrier wall extending over 300 feet below the top of the existing dam and a RCC dam to supplement the existing saddle dam and fuse plug.

BATTELLE, SACRAMENTO RIVER BANK PROTECTION PLAN (SRBPP), IEPR SAFETY ASSURANCE REVIEW, CA

Independent external peer review (IEPR) for the Phase II Post Authorization Decision Documents (PADD) for the Sacramento River Bank Protection Project (SRBPP), California, as a subcontractor to Battelle.

U.S. ARMY CORPS OF ENGINEERS, MEMPHIS DISTRICT, MISSISSIPPI RIVER LEVEE CONSTRUCTION, TUNICA-PARCEL 2 RELIEF WELLS, YAZOO-MISSISSIPPI DELTA LEVEE BOARD, IEPR SAFETY ASSURANCE REVIEW, TN

Review of proposed relief well and seepage berm. Proposed improvements are in an area that has experienced seepage problems during past high-water events.

ROZELL SURVEYING

CITY OF BRANSON

Multiple storm drainage, sanitary sewer and lift station easements and right-of-way surveys for the City of Branson, Missouri. The work included boundary surveys and exhibit and description preparation for new or unrecorded easements and rights-of-way within the City of Branson.

SUDDEN LINK, BRANSON, MISSOURI

Topographic survey and flood elevation study to determine flood impact study on existing facilities. Due to concern of the corporate office and the disasters prevention network a topographic survey on the existing facility was done and a detailed elevation study to determine the exposure to possible flood water.

PROJECT TEAM

CITY OF BRANSON

- **PROJECT LIAISON** — Richard E. Todd, P.E.
- **PROJECT MANAGER** — Karen S. Frederich, P.E., CFM
- **PROJECT PRINCIPAL** — James E. McCleish, P.E.
- **UNDERSEEPAGE INVESTIGATION** — Mike Lambert, P.E.
- **FIELD INVESTIGATION** — Rachel Goeke, P.E.
- **WASTEWATER TREATMENT PLANT SPECIALIST** — Robert J. Januska, P.E.
- **SUBSURFACE INVESTIGATION MANAGER** — Shane Rader, P.E.
- **SURVEYING** — Rozell Surveying & Engineering

KAREN S. FREDERICH, P.E., CFM | Project Manager – Environmental Engineering

Karen Frederich is a civil engineer experienced in flood protection and environmental projects. Typical projects have included construction management, hydraulic and hydrologic analyses for flood studies, FEMA flood insurance rate map changes, sewer design and rehabilitation, combined sewer consolidation, stormwater studies, and construction/ contract management of public works projects.

JAMES E. MCCLEISH, P.E. | Project Principal

Jim McCleish is an award-winning project manager who specializes in the areas of water treatment transmission and distribution, storage and pumping facilities and water supply feasibility studies. He also has extensive experience in the study and design of municipal wastewater treatment plants and collection systems and sludge management and is experienced in industrial wastewater, hazardous waste management, groundwater and soil remediation and stormwater permitting projects.

RICHARD E. TODD, P.E. | Project Liaison

Rick Todd has over 40 years of broad experience in industrial & municipal wastewater treatment design, construction management, field service, and sales & marketing support in and around the Springfield, MO area. Rick's project experience has ranged from designing and executing on-site pilot programs for a variety of industries to start-to-finish design/build management of major wastewater treatment installations with specific equipment expertise in dissolved air flotation, chemical feed equipment, biological treatment, primary screening, and electrocoagulation.

ROBERT J. JANUSKA, P.E. | Wastewater Treatment Plant Specialist

Bob Januska has over 30 years of experience in environmental engineering. He has managed multi-year investigation and capital improvement programs. He brings his clients the large program perspective to the selection, prioritization and scheduling of their projects to achieve program advantages. He has broad experience in the selection of construction delivery methods. Technical areas of specialization include regulatory driven collection systems improvement programs, wastewater facilities upgrade programs and integrated project delivery. He has extensive experience in the development of rehabilitation and repair programs for municipal and industrial owners.

MIKE LAMBERT, P.E. | Subsurface Investigation

Mike's qualifications and experience include a Master of Engineering Degree in Civil Engineering with a specialty in Geotechnical Engineering and over 27 years' experience as a practicing geotechnical engineer. During his career, Mike has worked on numerous dam and levee projects across the country, a few of which include; Howard Bend Levee System – design and evaluation of flood protection along the Missouri River near St. Louis, evaluation of the Rough and Ready Island levee system in Stockton, California, evaluation of the existing levee and proposed improvements to the Missouri Bottoms Levee in Hazelwood, inspection of over 484 miles of USACE levees, inspection of over 56 miles of US Bureau of Reclamation irrigation canals.

RACHEL J. GOEKE, P.E. | Field Investigation

Ms. Goeke has over 12 years of experience in the Geotechnical Engineering Consulting Industry. Ms. Goeke has been with Palmerton & Parrish, Inc. (PPI) since 2006, when she moved home to southwest Missouri after beginning her career with Shannon & Wilson, Inc. in St. Louis. Ms. Goeke's Project Experience includes development and execution of subsurface investigation programs, foundation design, retaining wall design, investigation and remediation of karst features and mining impacts, slope stability analysis, and forensic investigations. Ms. Goeke serves as Contract Manager for some of PPI's largest Clients, including the St. Louis District USACE.

SHANE M. RADER, P.E. | Subsurface Investigation Manager

Mr. Rader has been employed with Palmerton & Parrish, Inc. (PPI) since 2002, and has managed PPI's Drilling Services Department since 2005. Mr. Rader is recognized as a regional leader in Subsurface Investigation, Site Development, and Geology. Keynote projects overseen by Mr. Rader include the MoDOT Safe and Sound Bridge Program, PPI's KDOT On-Call Geotechnical Services Contracts, the Downstream Casino Resort, Branson Landing Development, CoxHealth New Patient Tower, and PPI's USACE St. Louis District IDIQ Contracts.

CAPACITY OF FIRM TO COMPLETE PROJECT

The Horner & Shifrin team has more than adequate capacity to complete this project for the City of Branson. With a staffing of 93 engineers, technicians and support personnel, Horner & Shifrin's environmental staff of 18 can provide the needed services within a realistic timeframe. Working out of our primary office in St. Louis, the project team will be supported by project liaison Rick Todd in Springfield.

Horner & Shifrin recognizes that design and construction projects often require flexible schedules to meet project deadlines. Our staff is ready to adjust work hours so that projects advance in accordance with the schedule. We are accustomed to meeting stringent project schedules and have repeatedly delivered accurate design for a variety of clients.

HORNER & SHIFRIN 93 EMPLOYEE OWNERS	
19	TRANSPORTATION/CIVIL ENGINEERS
18	ENVIRONMENTAL/SANITARY ENGINEERS
14	STRUCTURAL BRIDGE/BUILDING ENGINEERS
6	ELECTRICAL/MECHANICAL ENGINEERS
16	DESIGNERS/CAD TECHNICIANS
3	CONSTRUCTION ADMINISTRATION
4	GIS SPECIALISTS
4	SURVEYORS
9	ADMINISTRATION

SCHEDULE

We anticipate completing this project and presenting flood protection options to the City within 9 months of receiving a notice to proceed. The geotechnical investigation will take much of the first third of the 9-month time period. Some of the soil strength laboratory tests can take three weeks to complete. The flood modeling evaluation can begin and run concurrently with the geotechnical investigation. The other significant time investment will be the evaluation of the various flood protection improvement options.

	MONTH								
	1	2	3	4	5	6	7	8	9
Survey data collection									
Geotechnical Investigation									
Phase I -Review of existing info									
Phase II - Collection of field data									
Phase II – Laboratory testing									
Phase III - Analysis of existing conditions									
Phase IV – Alternatives evaluation									
Flood model evaluation									
Flood protection improvement options									
Benefit cost analyses									
Completion of report & present to the City									

GENERAL DISCUSSION OF HOW THE PROJECT WILL BE CONDUCTED

The stated purpose in the request for proposal states that the intent of the study is to provide recommendations for the flood protection of treatment plant facilities to meet current flood standards in order to reduce the risk of inundation to an acceptable level.

The study evaluating the various flood protection options at the Compton Drive Treatment Plant will involve several distinct data collection efforts, a thorough evaluation of the existing flood modeling data, including rainfall and/or other inputs that may affect the flood level, options to provide for increased flood protection at the treatment plant (and adjacent areas), and a cost-benefit evaluation of the various flood protection options.

SURVEY DATA COLLECTION

The data collection phase will set the foundation for the other phases of the study. The City-provided digital aerial photography and 2-foot topographical data will be used to determine the scope of a site-specific survey. It is likely that this site-specific survey will include collection of elevation information for the various treatment process basins, the location and depth of buried conduits (including storm sewers), the control building floor elevation and other penetrations into the building, other features that may impact the siting of flood protection improvements (overhead electric and trees that cannot be felled) and surface elevation information for the likely footprint of any proposed earthen levee or floodwall.

This site survey will be the basis of the development of a site plan for the study. The site plan will need to include all known subsurface features to determine impacts to flood protection. This will be accomplished with input from the City staff explaining how the various treatment features are connected via yard piping. With the help of City staff, the location, depth, pipe material,

joint type, and bedding type will be identified to determine whether existing subsurface infrastructure can provide a path for seepage.

The site survey will also aid in the geotechnical field work by locating providing the elevation of the ground surface at boring locations and at other specific locations needed for geotechnical analyses.

GEOTECHNICAL INVESTIGATION

Our team's approach to this project is modeled on the approach used successfully on many other similar projects. This approach delivers a high-quality design product for the owner within a reasonable schedule and for a reasonable cost. We propose a phased approach consisting of:

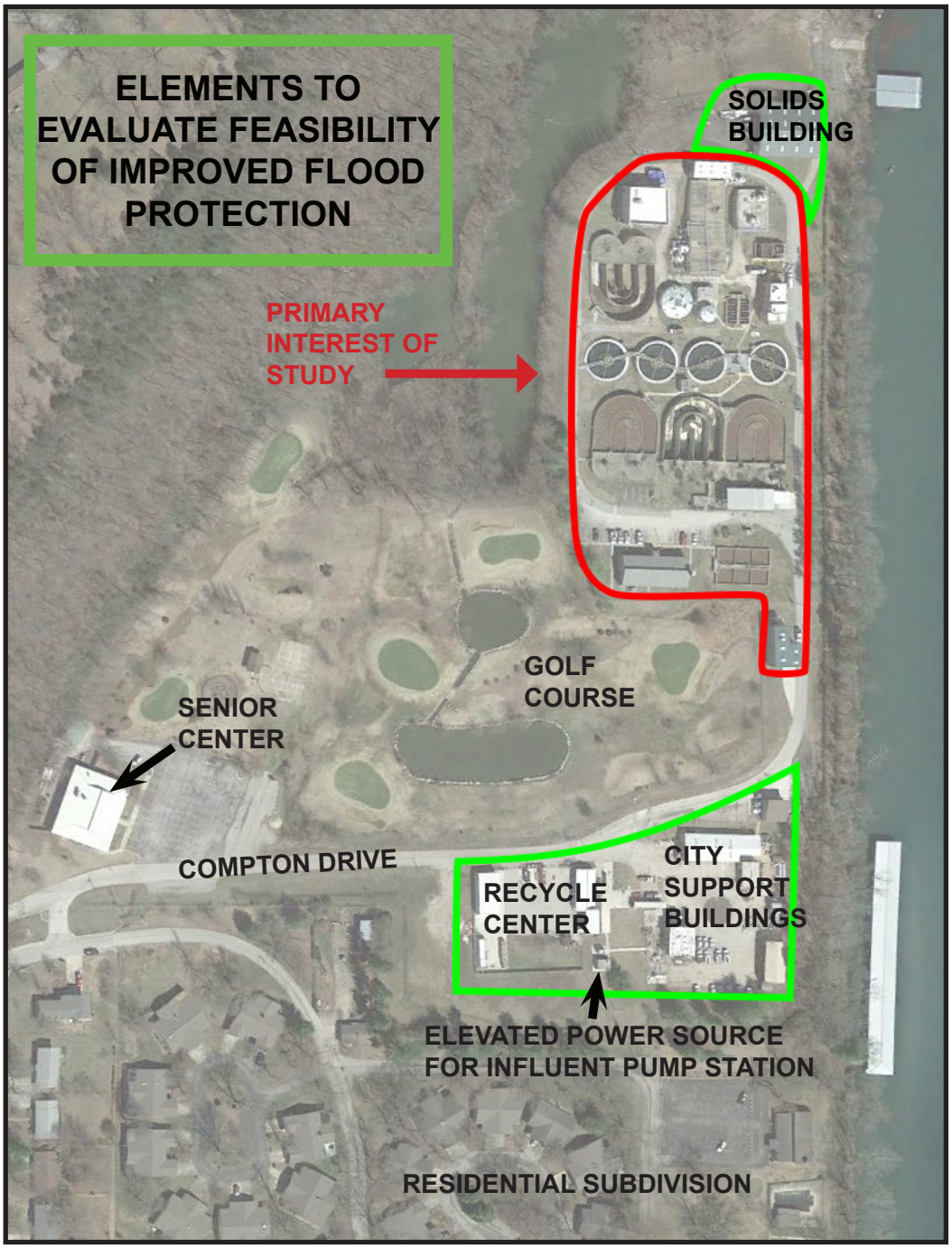
- **Phase I** – Review of existing information to determine data gaps;
- **Phase II** – Collection of additional field and laboratory data to fill the data gaps;
- **Phase III** – Analysis of the existing conditions; and
- **Phase IV** – Development and selection of possible alternatives and development of opinions of cost for those alternatives.

Phase I – Existing Information Review

Our first action will be to collect and review existing information from the City, USACE, FEMA, MDNR, and other identified sources concerning the area of the treatment plant. Information of specific interest will include existing boring logs, well installation logs, flood fight records, pumping records, construction records, documentation of the problems that occurred during original construction of the plant, groundwater elevations, and Lake Taneycomo elevations.

This data will be summarized and incorporated into our geographical information system, thereby allowing the entire project team to know what is available and quickly find that information. This information will then be reviewed by an experienced geotechnical engineer to determine expected problem areas and data gaps will be identified. Also included will be a review of physical plant features that could have a significant impact on geotechnical analyses such as deep underground manholes and tanks and pipe crossings.

Phase I should conclude with development of a data collection plan that is expected to include additional explorations, additional laboratory testing, and identification of specific plant features where location and elevations are critical from a geotechnical view point. Items that may or may not be included in a data collection plan include geophysical surveys, installation of piezometers, pump test(s), and long-term groundwater monitoring.



Phase II – Data Collection

As noted above, the specifics of the data collection effort will be determined after the existing data is reviewed. In this way we do not spend resources collecting data that already exists.

Expected data collection efforts include the drilling of several new borings. While the drilling plan will be developed by Shannon & Wilson, the borings will be drilled by Palmerton & Parrish. This allows the project team to capitalize on much of Shannon & Wilson's levee experience without the additional mobilization costs of traveling from St. Louis for the actual drilling. Likewise, most if not all of the laboratory testing will be performed by Palmerton & Parrish in either Branson or Springfield.

The drilling and sampling methods for the borings will be determined by a collaboration between Shannon & Wilson and Palmerton & Parrish. This allows the combination of the first's extensive levee experience with the local knowledge of the second. The combination of experience and local knowledge is critical on levee projects since the analyses can be significantly affected by small subsurface features.

The laboratory testing is expected to include a variety of tests including grain size, plasticity, undrained strength, and drained strength. These tests allow for determination of the variety of soil properties that are required to properly analyze the stability of the levee and model the seepage characteristics of the site.

Geophysical surveys, if determined to be beneficial during Phase I, would be used to estimate depth to bedrock and identify areas of more and less permeable soils. Geophysical methods that would be considered include MASW, ReMi, seismic refraction, and capacitively coupled dipole-dipole survey (Geometric OhmMapper).

If field monitoring of the groundwater conditions are determined to be necessary, such monitoring would include the installation of piezometers and at least one pumping well. The piezometers would likely be direct burial vibrating wire units that have a nearly instantaneous response to changes in groundwater levels. If installed, these units can also be monitored long-term, if such monitoring is determined to be beneficial to the project.

Phase III - Analysis

Following collection of the field data and completion of the laboratory testing, and determination of the design water surface elevation, analysis of the existing levee system can begin. We will use Engineering Manual 1110-2-1913 Design and Construction of Levees by the USACE as the basis of our analyses. Specific items that will be evaluated are the stability of the levee slopes, seepage through the levee, seepage beneath the levee (underseepage), settlement, and erosion. Of these items, underseepage is expected to require the most effort and is the only analysis discussed in detail herein.

The underseepage analysis will begin with a two-dimensional analysis at cross-sections selected around the existing levee. The results of these analyses will be compared to historical observations and the models revised as necessary to match those observations. The models will then be evaluated for the design water surface elevation(s) and stability of the soil evaluated. Due to the shape of the levee, three-dimensional effects will amplify the underseepage pressures; however, methods are available to approximate this amplification.

Depending on the results of the two-dimensional analysis, a three-dimensional model of the entire leveed area might be necessary. In our experience, a three-dimensional model is rarely needed; however, our team has a groundwater modeling group consisting of more than nine engineers, geologists, and hydrogeologists who develop and analyze several such models each year on projects throughout the country.

Following analysis of the existing conditions, the focus will shift to development of alternatives to remediate any identified deficiencies in the existing levee. Anticipated deficiencies include top of levee elevation and underseepage.

Phase IV – Alternatives and Plan Development

Raising the levee will require development of a proposed levee cross-section that meets current design guidance; again, EM 1111-2-1913 will be used to establish the design criteria for geotechnical items such as slope stability and underseepage pressures. Based on information contained in the request for proposal, it appears likely that underseepage pressures and flow quantities will also be a concern. If this is the case, options will be developed to reduce underseepage pressures and either reduce or manage the flow quantities. Determination of applicable alternatives will be made following the above-described work, but possibilities include relief wells with a pumping station and a cutoff wall. Underseepage berms, usually the least expensive option, are not possible due to existing plant facilities. Other options, their advantages and disadvantages, are shown in the table below.

Assuming a control device is needed, the choice between relief wells and a cutoff wall will require an evaluation of the initial costs, impacts to existing plant facilities, constructability, and future operating and maintenance costs for both options.

	Advantage	Disadvantage
Relief Wells	• Small footprint • Effective at relieving pressure at a predefined location	• High capital cost • Annual maintenance recommended • Rehabilitation and replacement is costly
Underseepage berms	• Low capital cost • Minimal maintenance cost	• Large footprint • Additional surface load can induce long-term settlement
Sheet pile cutoff wall	• Small footprint • Effective in reducing pressures	• Installation method may induce short term settlement • Buried obstructions may limit depth and/or extent of wall
Slurry cutoff wall	• Small footprint • Effective in reducing pressures • Installation method less intrusive when compared to sheet pile walls	• Large footprint is needed for construction • Buried obstructions may limit depth and/or extent of wall

The seepage analysis will also provide information useful in evaluating the operation of the existing groundwater check valves in the clarifiers, waste sludge tanks, holding tanks and aeration basins.

FLOOD MODEL EVALUATION

While the data collection phase is being executed, the evaluation of existing flood modeling data will begin. The hydrologic and hydraulic models used by FEMA to develop the current effective flood insurance rate map will be acquired to confirm how the White River Water Control Plan was addressed in their Flood Insurance Study. The current effective flood map shows the treatment plant in a flood zone but not in the floodway. This is significant as modifications in floodways are burdensome to accomplish.

It is possible that FEMA did not consider the operational triggers in the White River Water Control Plan as FEMA is simply interested in mapping the flooding hazards associated with the 1-percent annual chance flood. The water control plan will be reviewed to determine how to incorporate its effects to the flooding potential at the treatment plant.

Determination of FEMA-published 1-percent annual chance (100-year) and 0.2-percent annual chance (500-year) flood elevations are readily available on the White River flood profile in the Taney County Flood Insurance Study, dated March 15, 2012.

The current effective model used to determine the extent of flooding (and mapping) for the flood insurance rate map will modified to test the sensitivity of flood protection options to adjacent upstream and downstream properties. The goal of any flood improvement project is to not adversely impact any adjacent properties. While the hydraulic model will show the impacts of a rain event (and/or a lake discharge event), the hydrologic model can be used to determine the impacts associated with varying rainfall and runoff events in the tributary area. Rainfall frequency tables are an assembly of statistical interpretations of past rain events over a significant time frame. As an example, NOAA's Atlas 14 Point Precipitation Frequency Estimate for Branson Missouri shows that a 100-year, 24-hour rain event generates 7.2 inches of rainfall at the 90-percent confidence interval. The lower and upper bounds of the 90-percent confidence interval are 5.94 inches and 8.53 inches, respectively. Because the project site is between two impoundments, it may be informative to run the hydrologic and hydraulic models for the probable maximum precipitation to determine the ultimate risk to the treatment plant and whether it is feasible to design to this extreme event.

FLOOD PROTECTION IMPROVEMENT OPTIONS & COST-BENEFIT ANALYSES

The matrix below shows three flood protection solutions for the treatment plant and identify some of the competing interests that will be evaluated in an economic analysis. For all options, the affects to adjacent properties will be considered.

COMPETING INTERESTS	FLOOD PROTECTION SOLUTIONS		
	Flood Proofing*	Earthen Levee**	Concrete Floodwall***
Treatment plant hydraulics (including effluent pump station capacity)	X	X	X
Availability of suitable clay soil		X	
Interference with existing electric feed		X	X

* Flood proofing would involve extending the height of treatment basin walls and tops-of-structures to an elevation above the defined flood elevation as well as floodproofing the control building.

** Earthen levee around the perimeter of the treatment plant.

*** Floodwall around the perimeter of the treatment plant, including several vehicle access gates.

Flood protection-related enhancements will be evaluated incrementally so the City can decide, a-la-cart, which, if any, enhancements will be implemented. These enhancements include improvements to Compton Drive to maintain a dry accessway to the treatment plant, improvements to the recycling center, public works shops, the influent pump station, and old control building. Flood protection-related enhancements may include formal flood protection improvements and/or emergency action plans to mitigate losses and speed recovery efforts following a flood event.

There are many interim flood protection options available. With the relative short timeframe to act to protect the treatment plant, it will be important to evaluate which methods can be deployed and completed in a short time horizon and under less-than-optimum weather and daylight conditions. Options ranging from earthen fill to sand bags to Hesco baskets to geotubes can be evaluated for various metrics, such as, capital cost, cost to store, cost and time to implement, and deconstruction cost.

The deliverable of the study will be a comprehensive report documenting each phase of the project. The report will include extensive appendix content documenting the geotechnical field, laboratory, and analyses efforts, to support the investigation of flood protection options and the cost-benefits associated with each option.

Quality Assurance and Quality Control of projects are important to the project team. Internal peer reviews by engineering professionals confirm the project will be delivered satisfying the client scope of work and a review by a company principal will assure that the appropriate standards of care have been employed so the client can be certain of final document and recommendations contained therein.

QUALITY ASSURANCE / QUALITY CONTROL PROCEDURES

Quality Assurance/ Quality Control (QA/QC) is an essential part of every project. Horner & Shifrin conducts a vigorous QA/QC process during the life of the project, in particular at preliminary, intermediate, and final stages of the project. The process includes review of the design and/or report by a well-qualified professional engineer (who is not directly involved with the project) prior to each submittal. All items in the plans or report will be checked and verified using a two-person system of reviewing, checking, correcting and verifying. Using this two-person system (including the independent professional engineer) insures a high-quality product.

For reference, this system was used for the 3-mile segment of The New I-64 Design/Build project which was designed by Horner & Shifrin staff. While the scale of the New I-64 project is very large, this QA/ QC system can be useful and tailored to fit any project. We believe that the quality of any project can benefit from a comprehensive QA/QC system that is executable. Since almost all of the management and engineers assigned to this project were also assigned to the New I-64 Design/Build project, the QA/QC system to be used is fresh and ingrained in everyone's work ethic. Our goal is to provide the County with a high-quality product resulting from this QA/QC effort.

Horner & Shifrin's longevity in the engineering industry have hinged upon the high quality of our work and our dedication to client satisfaction. To assure satisfaction of these criteria, the following steps are taken from the inception to completion of the project:

- Establish design guidelines and standards to be used for the project.
- Establish plan preparation guidelines based on client's requirements.
- Maintain close coordination and open communication with the client.
- Ongoing daily interaction with the project engineers and review of their tasks by the project manager.
- Review of plans prior to each milestone submittal by an independent professional engineer utilizing an itemized checklist to insure accuracy and completeness.
- Monitoring cost of major construction items to insure compatibility with the client's budget.
- Preparation of construction cost estimate prior to each milestone submittal.

VALUE ENGINEERING

At Horner & Shifrin, Value Engineering (VE) is a systematic process using personnel from a variety of disciplines to improve the value of a project through the analysis of its functions. The VE process incorporates the values of design; construction; maintenance; contractor; client; other stakeholders; and the public. Analysis consists of gathering data, analyzing information, verifying costs, evaluating function-cost-worth relationships and saving alternates.

CONTACT

I will be the point of contact for the City on this project and will be very responsive to phone calls and emails. We have assembled a capable and experienced team to deliver a successful project for the City of Branson, and we look forward to working with you on this project. Should you have questions or require additional information, please call me at 314-335-8643 or by email at KFrederich@HornerShifrin.com. We look forward to working with the City of Branson on this project.

Sincerely,

Karen Frederich, P.E.
Project Manager
Environmental Engineering

James E. McCleish, P.E.
Vice President | Project Principal
Practice Leader, Environmental Engineering

MARKETS

Commercial
Education
Governmental Public Works
Health Care and Senior Living
Industrial
Municipal Public Works
Private Sector

ENGINEERING SERVICES

Airport Land-side Design
Bridges
Building Structures
Code Compliance
Construction Administration
Design/Build
Electrical Engineering
Emergency Response Facilities Design
Energy Audits
Environmental Assessments
Environmental Impact Statements
Facility Power Distribution Systems
Fire Protection Engineering
Geographic Information Systems
Grant Writing
Health Care Compliance Reviews
Highways, Roadways and Streets
Hydraulics/Modeling Studies
Infiltration and Inflow Studies
LEED/Sustainable Design
Levees/Navigation Structures
Mechanical Engineering
Parking Structures
Parks and Recreation
Pedestrian and Bicycle Facilities
Plumbing Engineering
Regulatory Review/NEPA Compliance
Residuals/Biosolids Management
Seismic Analysis and Design
Site Development and Drainage
Stormwater Engineering
Streetscapes
Surveying
Traffic Studies, Signalization and Calming
Transit
Value Engineering
Wastewater Treatment and Collection
Water Supply, Treatment and Distribution
Water Quality/Permitting

For Additional Information Contact:

KAREN S. FREDERICH, P.E. CFM
Project Manager
(314) 335-8643
kfrederich@hornershifrin.com
www.hornershifrin.com

CORPORATE HEADQUARTERS

The Power House at Union Station
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2296
(314) 531-4321

ILLINOIS OFFICES

200 S. Wacker Dr., Ste. 3100
Chicago, IL 60606-5877
(312) 332-4334

604 Pierce Blvd., Ste. 300
O'Fallon, IL 62269-2579
(618) 622-3040

152 Willow Road
Rochester, IL 62563-9430
(217) 899-8441

MISSOURI OFFICES

4061 Highway PP, Ste. 1
Poplar Bluff, MO 63901-3905
(573) 727-9666

4166 W. Kearney St.
Springfield, MO 65803-9509
(417) 865-7000

JACOBS

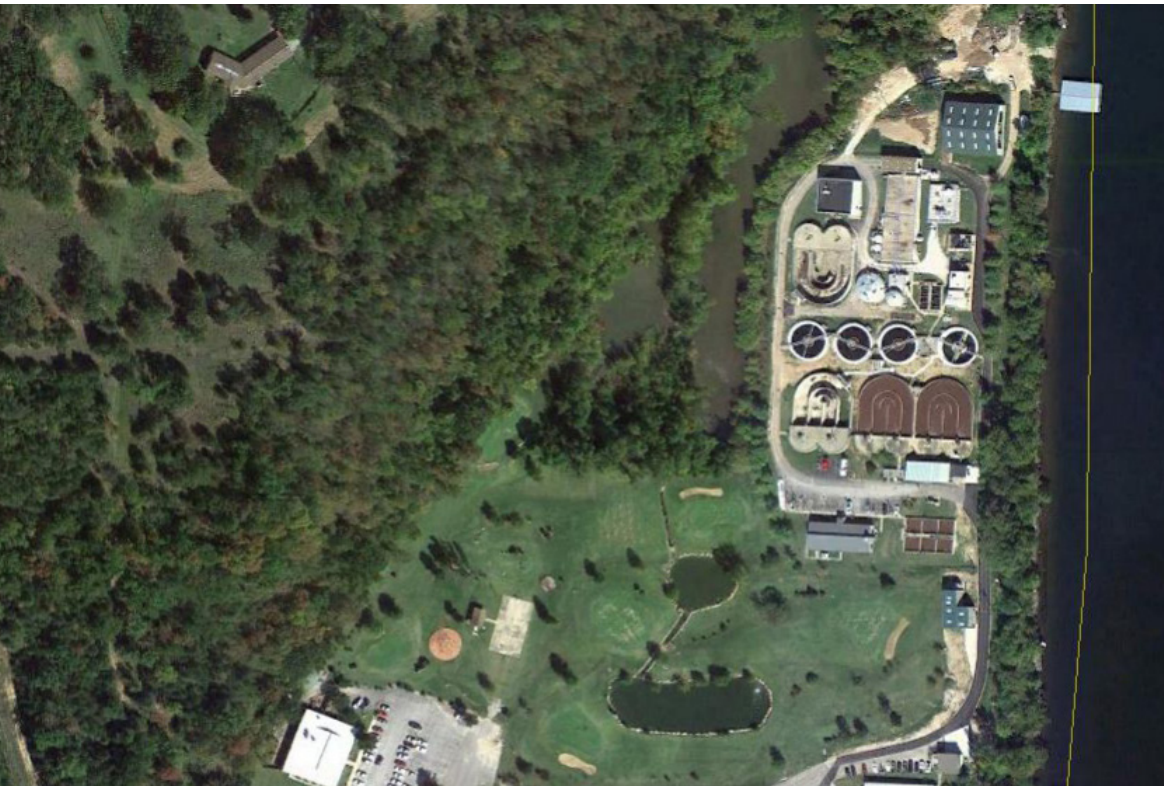
PROPOSAL FOR

Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements

City of Branson

Engineering/Public Works Department

March 2016



JACOBS

501 North Broadway
St. Louis, Missouri 63102 USA
Tel 1.314.335.4000 FAX: 1.314.335.5102

March 10, 2016

Mr. David H. Miller, P.E.
City Engineer
City of Branson
110 W. Maddux, Suite 310
Branson, MO 65616

Subject: Request for Proposal – Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Miller,

Thank you for the opportunity to submit our proposal for professional services associated with the flood protection alternatives study for the City's Wastewater Treatment Plant at Compton Drive. We are excited to serve the City in a specialized area that we are very comfortable with. Our extensive experience in flood protection engineering will **result in a comprehensive, practical study producing realistic alternative solutions** with accurate cost estimates.

We recently visited the project site, researched the FEMA and FIRM mapping for this area, and reviewed the rain gauge levels relative to your flooding in recent years. This information has given us a good sense of your current level of protection and a corresponding awareness of the anticipated challenges inherit with this project (i.e. raising your level of protection to the 100-year status within the available real estate). The good news is that **these challenges have been typical with each of our flood protection projects** and we are **accustomed to successfully solving these types of issues**.

We have assembled a core team that brings the relevant, targeted experience and the resulting best practices necessary to provide you with the highest quality professional services and deliverables for this assignment. Our selected team members average over 20 years of specific flood protection engineering experience similar to the task at hand. With this experience we bring innovative ideas specifically relevant to the flood protection challenges sought within this RFP. The key issues to your project's success – verifying the flood level with river modeling, determining the underseepage characteristics (and developing preventive alternatives), understanding how to flood proof the WWTP's utilities, analyzing flood protection alternatives (intermediate as well as long term), and developing comprehensive corresponding cost estimates – are commonly addressed by our qualified team. In addition to our engineering expertise, we have experience helping clients apply for federal and state funding sources for flood protection projects such as yours.

Our Project Manager Jeff Farah, P.E. has proven experience coordinating successful delivery of similar flood protection projects and studies for various clients including the United States Army Corps of Engineers and is committed to achieving your total satisfaction for this study and alternatives analysis.

Please contact Jeff at 314.335.4038 (jeff.farah@jacobs.com) if you have any questions or need any additional information regarding our proposal. We look forward to the opportunity to work with the City of Branson and the Public Works Department.

Sincerely,

Renee Ross, P.E.
Operations Manager

Jeff Farah, P.E.
Project Manager

Table of Contents

A. Project Understanding & Approach

The frequency of historical rainfall events across the White River basin has notably increased over the past two to three decades, resulting in the increase of flooding events for adjoining communities, one of which is the City of Branson. In recent years, three relatively large flood events have occurred over a short time period along the White River in Branson (2008, 2011, and 2015). In addition to these record flood levels becoming more commonplace, the rate at which these events peak has increased as well, resulting in a decreased amount of warning time for the public to react, including the City's emergency management team. This was particularly evident this past December as the Corps of Engineers were forced to quickly open all of the flood gates at Table Rock Dam in response to the extreme rainfall that occurred over a 2-day period on December 26-27.

It is our understanding that your Compton Drive Wastewater Treatment Plant (WWTP) was threatened by flooding and/or experienced underseepage in each of these three historical events and it is your desire to reduce the risk of future flooding that threatens the operation of your WWTP. The frequency and severity of these events have encouraged the City to take immediate action to improve the level of flood protection around the WWTP. An improved flood protection system will increase the overall safety and operability during future flood events and decrease the potential for contamination and sewer backup. These actions will also reduce the costs of emergency equipment that has been needed in the recent threatening events.

With this RFP, the City is seeking a qualified engineering consultant to develop a comprehensive flood protection study for your Compton Drive WWTP. For this study, the City needs an experienced team of engineers accustomed to working with FEMA and FIRM maps as well as performing the necessary hydraulic modeling of large water bodies (such as Lake Taneycomo). In addition to accurately model and determine the anticipated lake levels, it is important for the City to hire a team experienced in the specialized area of flood protection. A team that not only has extensive experience with designing floodwalls, levees, flood gates, flood prevention of utilities, road raises, determining the underseepage characteristics (and the corresponding seepage cut off alternatives), and developing accurate construction estimates for flood protection projects, but also a team experienced in working in an emergency flood environment who understand the critically important issues of having temporary flood protection measures accessible for ease of assembly. This is especially important if the City chooses to develop interim flood protection measures that may require a comprehensive emergency plan.

The intent of this study is to provide realistic recommendations for the interim and permanent flood protection of your WWTP, such that your needs are met and to provide cost estimates for alternatives for varying levels of protection.

Project Execution. Successful delivery of this study starts with an open project discussion with your staff. During this initial meeting, the City is able to reiterate its expectations for this project, convey details of past flood experiences, and identify specific operational details of the WWTP that impact flood control. We will share our experiences regarding flood protection work as well as our initial ideas for the project. Following our initial kick-off meeting and site visit, our project manager immediately holds an internal meeting with our team of specialist to discuss the findings and your priorities. We subsequently refine our initial work plan as necessary such that we can assure a successful completion of the flood protection study.

Below are the initial milestone tasks we anticipate following during the course of this study.

- As noted above, a kick-off meeting scheduled with the City to define project objectives, which will be a basis of our scope of work and milestone schedule for both short- and long-term solutions. Our initial site investigation occurs during the same period of the initial kick-off meeting.
- Initiate the topographic survey and, if necessary, geotechnical field crews.
- We continue our current investigation/verification of the flood stages at your WWTP. This includes coordination with the USACE- Little Rock District to incorporate their operations plan for the Table Rock Dam into our lake modeling of Lake Taneycomo.
- Following receipt of the site topography and initial flood level information, our design team begins to analyze the alternative mitigation measures, per each level of protection desired by the City, and prepare the corresponding cost alternative options for each level of protection. At a minimum, the following tasks are anticipated to be analyzed within the flood mitigation study:
  - Earthen levees vs. floodwalls analysis, including the of alternative alignments reviews.
  - Alternative floodwall types.
  - Underseepage cutoff alternatives.
  - Raising Compton Drive for emergency accessibility.
  - Extending the level of protection south of the plant in the area of the Recycling Center and intake pump structure.

- Review the WWTP utilities, determining the necessary improvements for flood protection.
- Develop construction cost estimates for various options associated with each level of protection chosen.

- We implement a cost benefit analysis for the different level of protection, similar to what we have completed for other flood protection projects.
- City reviews are encouraged and implemented into our schedule as deemed necessary by your staff.

We offer distinct advantages to enable a successful project delivery that should exceed the City's expectations. In additional to the basic components of this project approach, we bring extensive experience in flood protection analysis and design, coupled with our hands-on disaster recovery experience including assisting communities with finding funding resources for flood related work.

Study Issues. Below we address the 12 issues identified in your RFP. While our responses are intended to convey our initial thoughts and provide examples of similar experiences, the extent to which a given solution is analyzed and implemented would be fully discussed and vetted with the City's project team prior to inclusion in the report.

1. Design Criteria. In 2008, 2011, and 2015, extreme rainfall events occurred within the White River basin tributary to Table Rock Lake. These rainfall events resulted in large discharges passing through the dams' gated spillways. We investigate the circumstances surrounding these events and develop recommended design criteria for flood protection of the City's WWTP.

For the past 30 years, our Senior Hydraulic Engineer Tom Juen has successfully led riverine hydraulic modeling studies for a variety of flood protection and transportation projects along the Missouri, Mississippi and Ohio Rivers as well as many other smaller rivers and streams. Our St. Louis hydraulics group has developed and recommended criteria for flood protection for multiple projects along the Missouri and Mississippi rivers including the Riverport development, the Monarch-Chesterfield Levee, and St. Peters 370 Premier levee systems. Each of these have prevailed flooding conditions in recent years and each are highlighted in the "Project Experience" section of this proposal.

The FEMA flood insurance rate map (FIRM) panel 162, effective March 15, 2012, indicates the 100-year flood elevation at the WWTP site is about 718.8. The peak stage for the 2015 flood recorded at the USGS gage 07053600 (School of the Ozarks, located about five miles upstream of your WWTP site) was roughly elevation 718, which compares to a FEMA 100-yr flood elevation of approximately 725 as shown on the FEMA flood profile, Panel 28P. Per the Flood Insurance Study report, the 10-, 50- and 100-yr flood discharges at the Compton Drive WWTP site are 21,300, 82,200, and 125,000 cfs, respectively. The maximum average daily discharges from Table Rock Lake for the 2008, 2011, and 2015 flood events were 48,314, 68,985, 72,584 dsf (dsf is somewhat comparable to cfs). Thus, all of your recent events fall between the 10 and 50-yr flood recurrence interval.

For the St. Peters 370 project, we prepared revised hydraulic models of the Mississippi River that assessed the potential impacts to flood stages and evaluated mitigation options that aided the City in determining the preferred level of flood protection. We intend to provide similar analysis for your study.

2. Interim Flood Protection. To determine the choice(s) for interim protection measures, the estimated costs per level of protection should be compared to the projected annual funding and annual probabilities of water level exceedance to determine the efficacy of the measures. An interim measure that provides protection against a 100-year event and requires only three years of funding to implement may have merit, whereas a measure that provides protection against only a 500-year event, but requires thirty years of funding, may not.

Constructing interim protection measures, as opposed to constructing the desired level of protection all at one time, will likely add to the overall cost of the project. The most desirable interim measures are those that can be incorporated into the final plan with little to no modification. Where there is real estate for a levee embankment, constructing the embankment in phases can accommodate annual funding constraints. Where embankments are precluded by space constraints, floodwalls are the conventional alternative. To spread the cost over time, sheet pile (to eventually be used as a seepage cut-off beneath a concrete floodwall) can be driven in an initial phase and left projecting above current grade to provide temporary protection to a level intermediate between current grade and the final protection elevation of a concrete floodwall.

Development of specific interim measure recommendations requires topographic and real estate information and consideration of current vs. desired level of protection. During reconstruction of the hurricane and flood protection in New Orleans following Hurricane Katrina, our team designed and specified a system of "Hesco" baskets to provide interim emergency protection during the extensive rebuild phase. These large cube-shaped baskets are made of wire mesh and geotextile fabric filled with sand. The baskets can be stacked and arranged to provide protection to various levels. For one of the New Orleans projects, we designed a 12-ft-high stack of baskets. In another location, when a construction contractor was not able to meet the requirements of the project specifications for maintaining the required level of protection during hurricane season, we designed a temporary, braced sheet pile floodwall to be installed, then dismantled, section by section, as the permanent concrete floodwall was constructed.

3. Limit of Protection. Similar to our previous experiences where we provided studies that identified various levels (and limits) of flood protection for our federal and municipal clients, we provide the analysis necessary to accurately determine the alternative levels of protection for your WWTP, as well as the City's accompanying facilities immediately south of the WWTP. We present these options graphically for ease of understanding and presentation purposes, while highlighting the estimated construction cost per level of protection.

4. Protection Impacts. FEMA FIRM panel 162 illustrates that the WWTP is predominately located outside of the regulatory floodway delineated for the White River along Lake Taneycomo. We first obtain the hydraulic model for the White River from either the FEMA library or USACE-Little Rock District. We review the model input and output and develop revised hydraulic model(s), as needed, to evaluate impacts to adjacent properties and investigate mitigation that may be required. Since the plant is presently identified outside the floodway, flood protection improvements may be implementable without mitigation measure (per FEMA minimum standards). However, given the presence of existing development within the 100-yr floodplain upstream of the WWTP site, mitigation may be desirable by the City.

5. Extent of Flood Protection. The Missouri Department of Natural Resources (MDNR) defines the requirements for flood protection at wastewater treatment plants. Per the regulations, the treatment works structures and electrical and mechanical equipment shall be protected from physical damage by the 100-year flood. Additionally, the treatment works should remain fully operational and accessible during the 25-year flood. Your WWTP needs to be evaluated to determine the impact of a 100-year flood event on all structures and electrical and mechanical equipment. A cost-benefit analysis is conducted to determine overall cost of full protection per each flood level. Protection for the Recycling Center and other City-owned facilities south of Compton Drive will be itemized separately within the cost-benefit analysis.

6. Groundwater Pumping. Groundwater transmissibility is an important geotechnical engineering parameter that influences our design work on a daily basis. We have extensive experience modeling groundwater seepage through levees and earth dams to determine flow quantities and evaluate slope stability. We also have specific groundwater modeling experience to determine seepage below floodwalls and locks to check uplift forces and soil erosion/piping. We have planned numerous geotechnical site investigations, laboratory testing programs, and instrumentation plans for piezometer and monitoring wells to estimate the transmissivity of aquifers.

The geotechnical design of the Riverport Levee, the Monarch Levee System, the St. Peters Lakeside Levee, and the New Orleans Katrina Recovery Levee System each required extensive underseepage analysis. Underseepage analysis determines the subsurface materials ability to transmit water beneath the levee during design flood events. Controlling this flow is vital to prevent levee piping or undermining the levee base; either can result in a catastrophic failure. We performed geotechnical designs including several methods to provide the most cost-effective underseepage controls based on project specific site conditions and other constraints such as available real estate. These designs included seepage berms, keyways, seepage cut off walls, stability berms, pressure relief wells, or combinations of the same.

We are also the lead geotechnical engineer for Segments B-3 & B-4 of the USACE's Green Brook Flood Risk Management project in New Jersey. Construction includes a new 2,400-ft-long concrete floodwall, a 230-ft-long earth levee, a 6-ft-tall steel rolling date, and one pump station. Our design involves seismic analysis, global stability and seepage analyses of floodwall and levee sections, micropile design, foundation recommendations for pump station, and preparing plans and construction specifications.

To determine dependable underseepage flow characteristics, we use our extensive groundwater seepage experience. This information, coupled with the hydraulic parameters associated with site conditions (pumping head), are used to size pumps needed for the relief of interior seepage. Once the pump(s) size has been determined, we present a cost benefit analysis that evaluates the purchase of permanent vs. portable pump(s). Use of the existing City wet wells at the WWTP is also incorporated into our overall evaluation.

7. Groundwater Valves. The groundwater check valves used in concrete structures, including aeration basins, clarifiers, waste sludge holding tanks, and storage tanks, are typically pressure relief valves to prevent buckling/heaving/failure of the floor slabs during high groundwater conditions. When the groundwater pressure exceeds the tank water pressure, the valve will unseat and allow groundwater to enter the tank and relieve/equalize the pressure. There is usually a granular filter and sometimes fabric filter under/outside the valve to prevent soil fines from being swept into the tank and creating a void outside the tank. Once the groundwater level subsides to where the tank water pressure exceeds the groundwater pressure, the relief valve will close. However, sludge, solids, or debris can become lodged in the valve and prevent it from seating properly, thus allowing tank contents to leak out. Likewise over time, debris, deposits, corrosion, etc. may prevent the valve from operating/opening when needed. We develop standard operations and maintenance practices to provide reliable service of the groundwater check valves.

8. Roadway Elevation. Maintaining emergency access to your plant is critically important and a focused item of interest in our study. In concert with the investigations performed to address the issue of how additional flood protection for the WWTP impacts upstream citizens, we evaluate Compton Drive improvements into the hydraulic models generated for this study. We incorporate various levels of the road raise into the cost/benefit analysis for the overall protection of your WWTP.

Road raises and securing safe and dependable access is commonplace within each of our flood protection projects. For the St. Peters 370 Premier project, we designed a road raise of a 4-lane arterial roadway to match the proposed elevation of the top of levee. See Section "F" for additional examples of road raises.

9. Effluent Pumping. The impact of the maximum flooded lake level on effluent pumping is evaluated. Effluent pumping capacity is evaluated based on pump discharge piping configuration to the outfall, pump operating curves, and lake level at the effluent outfall. Based on the selected alternative for flood protection, the effluent piping is evaluated to prevent backflow into the contained area of the WWTP.

10. Seepage Cutoff and Utilities. Coupled with our underseepage analysis noted in item #6 above, we evaluate practical options for seepage cutoff and incorporate each into our overall cost benefit analysis.

We also implement a complete utility investigation during the initial phase of the study. Particular focus is given to each utility that penetrates the perimeter of the WWTP. In addition to the location, size, and depth of each parameter utilities, understanding the structural integrity and operability of each utility is noted. This includes the condition and functionality of the operating valves. During our project kick-off meeting and initial site visit, we meet with the City's plant operation personnel and discuss the plant's utility configuration and condition.

Utility investigations, along with the design of a variety of valves and gated structures, are an integral part of our flood protection experience. Our successful projects with the

USACE, municipalities, and private clients have all demanded careful evaluation and detailed design on a variety of utilities mitigation measures including stormwater sluice gate structures, outfall flap valves, check valves, and underground utility anti-seepage cutoff collars. Our best practices from these projects will certainly benefit the City of Branson with this effort.

11. Cutoff Installation. The influence of new construction on existing structures is a design element that impacts nearly all of our projects. We have broad experience designing shoring systems and instrumentation plans to protect and monitor existing structures affected by adjacent construction. We are the lead geotechnical engineer for the Chesapeake Bay Bridge-Tunnel, New Thimble Shoal Channel Tunnel in Virginia. The future tunnel is planned between two existing portal islands, 250 feet west of the current tunnel alignment. The proposed tunnel has a length of approximately 5,500 feet and constructed at a maximum depth of 110 feet below sea level. Our geotechnical engineering services included characterization of the subsurface geology and identification of compressible organic clays and peat. Our analyses included settlement modeling of the island surface, existing tunnel approach walls, and tunnel ventilation building due to installation of a 1,000-ft-long, 30- to 40-ft-deep shored excavation. The design accounted for settlement due to sheet pile installation, secant pile wall construction, and dewatering of the excavation (up to 50 feet below the island surface).

Although our analyses for your WWTP's flood protection study have not yet begun, we do not foresee a need to dewater the site to install flood protection features. Because the major plant facilities are supported on piles to bedrock, soil consolidation due to vibrations is less of an issue than it would be if the existing structures were founded directly on soil.

We investigate subsurface conditions and determine susceptibility of soil strata to consolidation and the attendant issues of settlement and pile downdrag in concert with our development of flood protection alternatives. If soil strata are susceptible, alternatives to vibration-inducing cutoff and pile installation techniques will be developed.

Candidates for pile installation below concrete floodwall, if necessary, include drilled shafts and micropiles. It may be

that there is not enough depth of overburden above bedrock to resist uplift loads on piles beneath floodwalls, necessitating socketing deep foundation elements into bedrock, making drilling the most logical alternative. We employed this approach for the recent Green Brook flood protection project for the USACE in New Jersey.

Alternative candidates to driven sheet pile for seepage cutoffs include soil grouting, slurry wall, and pushed, rather than impact or vibration driven, sheet pile. Where earthen embankment levees are used, relief wells, rather than cutoff walls, are generally employed to control underseepage.

12. Funding Assistance. Our team will support the City of Branson investigate available federal, state, and other funding sources. Options include, but are not be limited to, the State Revolving Fund (completion of the Missouri Water Wastewater Review Committee application), FEMA Grants, and any identified secondary funding sources. Assuming available funding will not come from a single source but rather multiple sources, we consider the evaluation criteria of each of the available sources and ensure that the criterion are taken into consideration when studying design options so that the City's project is made as competitive as possible under specific grant evaluation guidelines.

Field Survey. For your study, Jacobs has teamed with Schultz Surveying & Engineering to perform the required surveying services. SSE's Branson survey team includes Wendell Beard and Jeremy Nickols, who have spent their entire career surveying in Branson, which has provided them a keen understating of the area and a good working relationship with local City personnel. SSE's seasoned team has significant experience in flood protection that ranges from flood buyout surveys and flood certificates for FEMA as well as various property owners in Branson and Taney County. Other survey projects in the area include Ballparks of Branson, College of Ozarks Acacia Road Relocation, Taney County Regional Sewer District's Evergreen and Hwy. East 76 Sewer Line Extension, and numerous property surveys.

B. Schedule

Our anticipated schedule for this study is based on our experience with similar flood protection studies. We encourage meetings with your staff and stakeholders; this schedule may vary depending upon how many meetings you determine are necessary.

This schedule does not include any geotechnical field investigative work, as we assume that existing soil boring information and geotechnical reports will be provided by the City at the onset of this project.

		Month 1				Month 2				Month 3				Month 4		
TASK	NTP	wk 1	wk2	wk 3	wk 4	wk 5	wk 6	wk 7	wk 8	wk 9	wk 10	wk 11	wk 12	wk 13	wk 14	wk 15
Client Kick off Meeting *(optional Interactive Planning with City)*																
Field Survey																
Utility Investigation																
PRELIMINARY - Alternative Identification																
Hydraulic Analysis																
Geotechnical investigation																
Civil Site Investigation																
Structural Investigation																
WWTP Investigation																
Cost Estimate																
Meeting with City																
FINAL - Alternative Development																
Hydraulic Verification																
Geotechnical Study																
Civil Site Study																
Structural Study																
WWTP Study																
Cost Estimate																
Draft Report																
Meeting with City																
FINAL REPORT																

C. QA/QC

We apply quality to planning, preliminary and final design, oversight and management, accounting, administration, and project controls. Our Quality Control process is job specific and developed based on your requirements.

We conduct a Client Expectation Survey with you at project kickoff, and then use a Client Satisfaction Survey at predetermined intervals during project execution to determine whether our team is meeting or exceeding your expectations of quality. Based on your feedback, we implement quality improvement measures. **The average Client Satisfaction Survey score during fiscal year 2015 for the St. Louis office was 96.29%**

Our approach requires Jacobs' personnel to follow the processes in the Job Specific QA/QC Plan. For project-related QA/QC activities, our Quality Manager is responsible for establishing and implementing the quality procedures for the City of Branson project, including those for Jacobs and our subconsultant. The Project Manager and Quality Manager work closely when developing the plan.

*Fundamental to monitoring the performance of our project work and driving good practices into all projects is a series of **monthly interlocking internal reviews** which address safety, value, scope, change control, staffing, technical status, deliverables, schedule, financial control, etc.*

"This is one of the largest public projects the City of Cape Girardeau has ever undertaken. With Jacobs on the project, I don't lose sleep about the details, because I know Jacobs' staff is on top of things."

Kelly Green, P.E., former Assistant City Manager – Development Services, Cape Girardeau, MO, commenting on the City's new wastewater treatment plant

D. Value Engineering

One of our biggest differentiators and keys to project success is our Jacobs' *Value Plus* program, which is one of our best practices. We employ value engineering on every project as part of our design process. During the initiation of your project, Jeff Farah will work with his team to identify value engineering opportunities. These ideas are monitored throughout the project and discussed with your staff after we have vetted their benefit and applicability.

In preparation for this proposal, we've already begun to discuss potential opportunities related to underseepage cutoff options and floodwall types as well as the combination of raised levee and floodway. Our goal is to save you money and time while adding value on the project.

Value Plus

Jacobs *Value Plus* is a methodology used to foster and capture ideas to reduce costs, followed by adoption and implementation of the cost savings measures. As opposed to a formal value engineering session that typically occurs at a predetermined milestone in the design process, our *Value Plus* initiatives occur throughout the life of the project – from concept to close-out – and can be initiated by any member of our project team, management, or staff.

- Using *Value Plus* for Public Water Supply District No. 2 in St. Charles County, we identified $300,000 in savings on the a Booster Pump Station by utilizing a new step-down transformer instead of the existing medium-voltage transformer.
- We have helped Metropolitan St. Louis Sewer District save over $110 million over eight years in association with their Capital Improvement and Replacement Program on our Watershed Facility Planning Project.

Sustainability+/LEED/Envision™

In addition to Leadership in Energy and Environmental Design (LEED) certified staff, we also serve our clients through staff accredited in the Envision™ Sustainable Infrastructure Rating System, which provides a framework for evaluating and rating the community, environmental, and economic benefits of all types and sizes of infrastructure projects such as roads, bridges, pipelines, dams, levees, landfills, treatment systems, and other types of facilities.

Jacobs helps clients with a variety of innovative engineering approaches that can reduce up-front costs or long-term operating and maintenance expenses. Examples of environmentally innovative ideas we have provided our clients include:

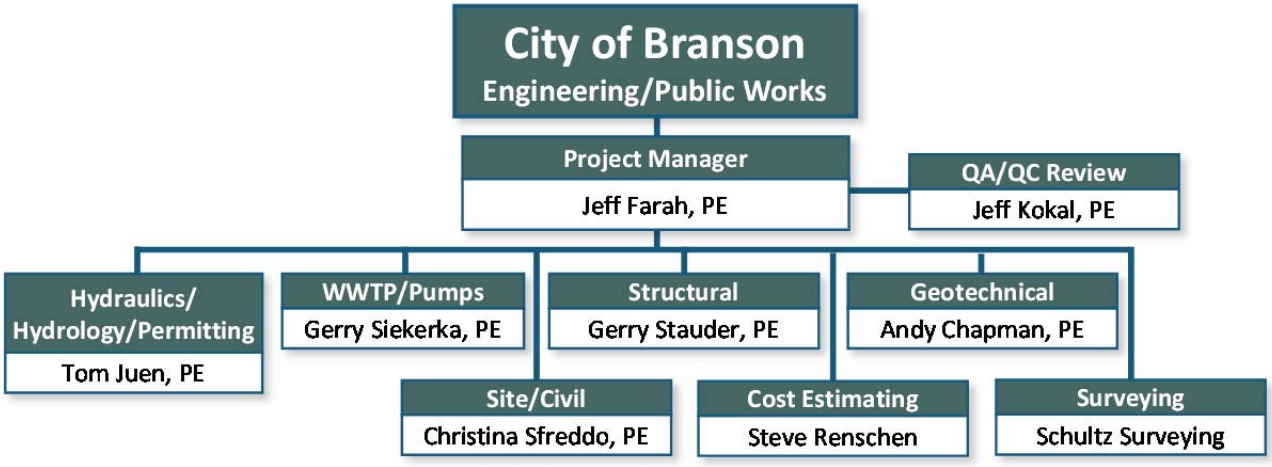
- Worked with Public Water Supply District No. 2 of St. Charles County and AmerenUE to identify the energy savings associated with using a new Variable Frequency Drive (VFD) at the WTP. This resulted in an incentive check for over $17,500.
- Identified a $40,000 incentive from AmerenUE by incorporating VFDs into the Weldon Spring Training Area Army Booster Pump Station design for PWSD2.

JacobsSustainability+ records ideas that generate sustainable benefits to you, such as the sourcing of local materials or energy reductions through reduced hauling. These savings are reported in metric tons of CO2. You may find this an excellent tool for further promoting the City of Branson and the Engineering/Public Works team as good stewards of the environment.

E. Project Team

We have flood protection subject matter experts under one roof to efficiently perform the analysis you need. We can call upon additional bench strength of more than 250 professionals in the state with diverse skills, including 70 Missouri-registered professionals. We provide the flexibility, responsiveness, and peace of mind needed to deliver your study under any constraint – budget, schedule, site, regulatory, or public scrutiny.

Project Manager Jeff Farah, P.E has successfully led a variety of projects – from planning to design through construction – including USACE flood protection/restoration, stormwater improvements, stream and river modeling, and infrastructure improvements involving a variety of financing and loan (SRF, HUD, CID, etc.) applications. A Missouri-licensed engineer since 1990, Jeff is very familiar with the Branson area, having lived and worked in Springfield for 16 years during his 31-year career. He currently manages a Community Development Block Grant (CDBG) project for City of Joplin.



Following are brief resumes for Jeff and his team. All engineers are licensed in Missouri and located in St. Louis.

Jeff Farah, P.E. – Project Manager

Flood Protection Emergency Management – Ste. Genevieve, MO. Project Manager for various disciplines to design a new water well system, renovate a water treatment plant, a new sanitary pump station and a new sanitary line, and street improvements. Served as Project Manager and assisted in managing the preparation of flood damage assessment and development of the flood restoration plan under an emergency response. Coordinated with the City and FEMA throughout the project.

Bannister Road Flood Protection, USACE-Kansas City District – Kansas City, MO. Lead Civil Design Engineer/ Assistant Project Manager for project consisting of large earthworks design involving earthen containment levees, dredging plans (1 to 3 million cubic yards per project), concrete and sheet pile floodwalls, pump stations, gated drainage structures, utility coordination and relocations, rolling gate closures (for vehicular and railroad crossings), and general civil engineering design including roadway modifications (including signaled intersections), levee alignment design, grading plans, environmental containment plans, and permitting. Managed the design of traffic signals and coordinated easements and right-of-way.

Missouri River Levee System, Unit L-385, USACE-Kansas City District – Riverside, MO. Civil Design Engineer for design of levee alignment, floodwall alignment, stormwater structures, utilities, and roadway improvements. Managed the design of traffic signals and coordinated easements and right-of-way. Assisted in developing the dredging plan.

Navigational and Ecosystem Sustainability Program, USACE-St. Louis District – Dresser Island, Upper Mississippi River. Civil Design Engineer for developing the dredging plan and designing levee alignment and drainage structures.

Disaster Recovery Program, Joplin Yellow Area CDBG-DR2 – City of Joplin, MO. Project Manager overseeing and managing infrastructure improvements within the designated "Yellow Area", relevant to the 2011 tornado recovery program sponsored with FEMA and CDBG disaster relieve funds. Works directly with the City's public works director and with the CDBG disaster audit team to assure that the City's goals are met and in compliance. To date, projects consist of the completion of the 90-day infrastructure study for a 750-acre tornado stricken area, the design of four separate stormwater and roadway improvement projects involving initial damage assessment, reporting/recommendations, and final design and construction documentation. Leads the coordination between City staff, subconsultants, the City's CDBG audit manager, and other consultants involved in the disaster

recovery program. Manages all coordination meetings, invoicing, project execution, and delivery.

Various Infrastructure Improvements – City of Springfield, MO. Project Manager and Lead Civil Engineer on several street and sewer improvement infrastructure projects for the City over a course of 12 years. Projects include streetscape enhancements, roadway widenings, and intersection improvements as well as storm water and sanitary sewer enhancements. Each project typically included design of drainage, sanitary sewers, traffic signals, ROW documentation, and utility improvements that support municipal infrastructure improvements. Projects include an intersection expansion, an intersection improvement, a street widening, and stormwater improvements.

Thomas Juen, P.E. – H/H and Permitting

Premier 370 Business Park – City of St. Peters, MO. Project Manager for preliminary engineering studies and final design for the proposed development of 500-year levee and 1,600-acre business park. Included a hydraulic study of the Mississippi River and its floodplain using HEC RAS, geotechnical investigations, and an interior drainage analysis to determine detention requirements and pump station capacities using ad-ICPR.

Green Brook Flood Risk Management, USACE-New York District – Middlesex, NJ. Hydrologist/Hydraulic Engineer for QA/QC of the hydrologic modeling and design analysis of a new pump station, with four submersible pumps using HEC-HMS. Included exterior boundary conditions based on the Green Brook flood hydrograph coincident with interior flooding events.

New Pump Station at Grassy Lake, USACE-St. Louis District – Wood River, IL. Hydraulic Engineer for re-evaluation study (hydrologic analysis) using HEC-IFH. Included coincident-frequency analysis of Mississippi River and interior flooding events.

Comprehensive Everglades Restoration Plan, South Florida Water Management District. Design Review responsible for independent technical review of all engineering studies and construction documents prepared by the design consultant firms. Review included hydrologic and hydraulic modeling studies as well as construction document review for wetland treatment areas, pump stations, and canal improvements.

Monarch-Chesterfield Levee, Chesterfield Valley – St. Louis County, MO. Monitoring and inspection team member during the Missouri River flood relief efforts. Performed hydraulic analysis of Bonhomme Creek for preliminary engineering for the proposed 500-year levee improvements. Performed preliminary drainage design for two wetland mitigation sites under a valley-wide permit.

Riverport Development, Riverport Associates – St. Louis County, MO. Analyzed interior drainage/detention volumes and checked channels and storm sewers.

Page-Olive Connector Design-Build, St. Louis County Dept. of Highways & Traffic and Public Works – St. Louis County, MO. Senior Hydraulic Engineer for floodplain analysis and hydraulic modeling of Creve Coeur Creek using the HEC-RAS program. Because the project included unavoidable construction within the floodway of the creek, it was necessary to develop the project so that 100-year flood elevations would satisfy a "no-rise" condition. Prepared Floodplain Development Application documents for submittal to City of Chesterfield and Conditional Letter of Map Revision (CLOMR) documents for submittal to FEMA.

St. Charles Department of Parks and Recreation – St. Charles, MO. Project Manager/Hydraulic Engineer for the acquisition of Section 404 and Section 401 for the construction of a new 110-acre recreational park located on a FEMA buyout parcel within the floodplain of the Missouri River. Acted as permit agent to prepare permit application documents and perform consultation with USACE regulatory staff. Other tasks included hydraulic modeling of the river to evaluate impacts due to park grading and permitting support to obtain a floodplain development permit.

Gerry Siekerka, P.E. – WWTP/Pumps

Wastewater Treatment Plant (WWTP), Rock Creek Public Sewer District – Jefferson County, MO. Project Manager/ Process Engineer for a new 4.8-mgd (20-mgd peak) sequencing batch reactor treatment plant, 20-mgd influent pump station, headworks with septage receiving, bio-solids treatment, operations building, nutrient removal ready design, and flood protection. The $24-million project was financed through a Missouri SRF loan. The plant received MWEA *Treatment Plant of the Year Award* in 2009.

Digester Storage Improvements, Coldwater Creek WWTF, MSD – St. Louis, MO. Prepared a plan for converting two second stage anaerobic digester tanks into sludge storage tanks. Project included self-priming pump, control valves, instrumentation, and tank and cover repairs and coating.

WWTP Improvements – City of Moberly, MO. Project Engineer for design of improvements to 2.5-mgd SBR plant consisting of new 1.3-mg concrete storage tank with aeration system, floating aerators for digesters, SBR sludge wasting process control improvements, equalization basin dewatering pump system, and emergency generator.

WWTP – City of Cape Girardeau, MO. Process Design Engineer for a new 11-mgd (50-mgd peak) WWTP including pumping station, screening, grit separation, activated sludge process, 60-inch outfall sewer, service water pumping, sludge and scum pumping, laboratory, and operations and process buildings.

WWTP Expansion – City of Washington, MO. Project Engineer for a new 4-mgd (12-mgd peak) WWTP. Prepared design hydraulic and process calculations, and assisted in PS&E production.

Comprehensive Everglades Restoration Plan, South Florida Water Management District. Technical Reviewer for mechanical design of pump stations for conformance with USACE standards. Reviewed basis of design, preliminary, intermediate, and final design PS&E. Pump stations varied in configuration and capacity up to 3200 cfs (2 bgd) featuring electric submersible and engine driven vertical turbine pumps and siphon discharge systems.

Bissell Point WWTP Wet Weather Impacts Analysis, MSD – St. Louis, MO. Prepared Technical Memorandum for analysis of impacts of wet weather flow to 400 mgd (619 cfs) on treatment plant performance to reduce CSO. Analyzed unit process hydraulics, pump station, plant efficiency, and plant improvements including influent pumping, primary clarification, hydraulics, and solids pumping.

Gerry Stauder, P.E. – Structural Design

Green Brook Flood Risk Management, USACE-New York District – Middlesex, NJ. Project Manager for design of flood control measures in Segments B-3 and B-4 along the west bank of Green Brook and Bound Brook. Included real estate acquisition drawings, utility relocations, maintenance and protection of traffic (detour) plans for permit, flood hazard area (stream encroachment) and fresh water wetland disturbance permits, soil erosion and sediment control permits, and pollution discharge elimination system permits.

L-8 Reservoir, Archer-Western/South Florida Water Management District. Value Engineering effort with design-build team on pump station to lift water from a reservoir into an adjacent canal. VE resulted in eliminating soil anchors and reducing concrete and reinforcing quantities, which produced an overall cost savings.

Missouri River Levee System, Unit L-385, USACE-Kansas City District – Riverside, MO. Originated design of flood wall gates for alternatives study. Performed time response study to compare times required for mobilizing and closing various types of flood wall closures (rolling gate, stop log, sand bag) to time available as water rises. Provided final design of movable flood wall gates. Coordinator MCACES estimates.

Lake Pontchartrain Vicinity Floodwall Replacement, USACE-St. Louis & New Orleans Districts. Project Manager for Preliminary Engineering Report (PER) and Final Plans and Specifications (P&S) to replace levees and floodwalls in the marina area following Hurricane Katrina. During the PER effort, design, analysis, and cost estimates for trade-offs between levee, floodwalls, and alternative alignments were generated. During the P&S effort, geotechnical, civil, and structural design and analyses were performed and construction contract documents generated for work in two construction phases. The first phase covered construction to restore existing levees and floodwalls to authorized elevations after years of general subsidence had occurred. The second phase covered replacement of existing levees and floodwalls to provide protection to a higher elevation.

Inner Harbor Navigation Canal (IHNC) Floodwall Study, USACE-St. Louis & New Orleans Districts. Project Manager for post-Hurricane Katrina study of existing floodwalls on the east and west sides of the IHNC. Approx. 28,000 LF of floodwall is in the study area, the great majority are I-walls. A sampling of wall sections was analyzed and preliminary design alternatives generated to restore the top of wall to the authorized level without wholesale wall replacements.

Task Order Contract, USACE-St. Louis District. Project Manager and Structural Engineer for a variety of task orders, including a 3-dimensional seepage analysis for proposed 1,200-ft lock chamber at Lock 25 on the Mississippi River to determine how much pumping capacity is required to prevent uplift of the lock floor and to prevent sand boils when the lock chamber is partially and fully dewatered.

Pump Station Stability Study, USACE-Jacksonville District. Performed stability analyses on several pump stations around Lake Okeechobee for new water levels occasioned by changes in the Corps' operating plan.

Water and Wastewater Treatment Plant, Hydrogen Energy California (HECA). Structural Lead for preliminary engineering of raw water, process water, and wastewater treatment for a combined plant. Included design of tank and equipment foundations, large and small pipe racks and bridges, elevated foundations for prefabricated electrical equipment buildings, access platforms and walkways, equipment support structures, and sumps.

Andy Chapman, P.E. – Geotechnical

Access Canal Navigation Lock Stability Study, NASA, John C. Stennis Space Center – Hancock County, MS. Geotechnical Engineer evaluating the cause of settlement and subsequent rotation of several concrete monoliths making up the lock walls. Each monolith was approx. 42x60 feet and weighs in excess of 15,000 kips. The study involved eight monoliths and suggested that the likely cause of foundation settlement was due to erosion of the foundation subgrade through the existing underdrain system. Responsibilities included settlement calculations, evaluating micropile underpinning and compaction grouting techniques to reduce future movement, and developing an instrumentation plan for monitoring the structure.

Stormwater Detention Basin, Cargill, Inc. – Eddyville, IA. Performed global stability analyses of 40-ft-high cut-and-fill slopes using SLOPE/w. Prepared recommendations for construction of the basin slopes. Geotechnical challenges included unsuitable fill and the potential exposure of

weathered sandstone and shale near the toe of the cut slopes.

Earth Retention and Slope Stability, U.S. Appalachian Petrochemical Plant, Shell Global - Monaca, PA. Geotechnical Engineer for designing the analysis of two sheet pile bulkhead walls with maximum retained heights of up to 37 feet. Earth anchors were required for the larger walls and were sized using SPW911 and Shoring 8 software. An extensive lateral load analysis was also necessary due to the additional lateral loads conveyed by 48-inch-diameter steel king piles supporting the barge mooring bollards. A crane unloading area behind the bulkheads required a structural slab robust enough to carry live load surcharges of as much as 5,000 psf. Included recommendations for 24-inch pipe piles extending 80 feet to support this slab.

Ohio River Bridges Downtown Crossing, Kentucky Transportation Cabinet – Jefferson County, KY. Geotechnical Engineer for several structures, including: design recommendations for auger cast piles supporting a new sewer protection structure; design review of H-Pile, drilled shaft, and micropile foundations; pile group analysis of the existing pier foundation supporting the I-65 JFK Bridge to determine its stability under scour conditions; and a soil reaction analysis of the North Toll Gantry foundation and its impact on an adjacent MSE wall.

Christina Sfreddo, P.E. – Site/Civil

Green Brook Flood Risk Management, USACE-New York District – Middlesex, NJ. Lead Civil Engineer supervising design and plan preparation of civil elements including right-of-way, alignments, profiles, storm sewer profiles, levee design, site grading (including ponding areas at pump station and secondary site), and road reconstruction at closure gate.

Disaster Recovery Program, Joplin Yellow Area CDBG-DR2 – City of Joplin, MO. Project Engineer for program to repair, replace, renovate and/or reconstruct public infrastructure within the area impacted by the 2011 tornado including all aspects of design for 32nd Street portion of the study area.

Lake Pontchartrain Vicinity Floodwall Replacement, USACE-St. Louis & New Orleans Districts. Design Engineer on a study to determine flood protection system for LPV-101 from 17th Street Canal to Topaz Street. Duties included preparation of right-of-way, utility, and construction plans for flood wall and levee systems.

Monarch-Chesterfield Levee, Chesterfield Valley – St. Louis County, MO. Design Engineer responsible for levee geometry, plan/profile sheets, cross sections, and earthwork. Project included the repair and upgrade of an existing levee system to the 500-Year flood level to USACE design criteria.

I-270 Chain of Rocks Canal Bridge, Illinois DOT – Granite City, IL. Project Manager as subconsultant on final design (PS&E) of a new bridge. Responsible for design of relocated levee and associated features and coordination with USACE. Duties also included pavement marking plans, erosion control plans, and alignment ties and benchmarks.

Steve Renschen, CPE – Cost Estimating

Green Brook Flood Risk Management, USACE-New York District – Middlesex, NJ. Cost Estimator.

New WWTP – Washington, MO. Chief Estimator for a new $20-million, 4-mgd wastewater treatment plant with raw sewage pumping, final clarifiers, sludge pumping, and effluent pumping. The influent raw sewage pump station was designed for 15 mgd. The effluent pump station was designed to pump to a head tank that provides sufficient head required to discharge effluent to the Missouri River during high flood stage.

Northeast WWTP – City of Bonne Terre, MO. Cost Estimator for Value Engineering, redesign, and bidding for construction management at-risk. The new facility was a 0.90-mgd extended aeration wastewater treatment plant.

WWTP Expansion – Farmington, MO. Lead Estimator for the pricing improvements to a 24-mgd plant expansion. Project included influent pump station expansion, new primary clarifiers, modification of existing aeration basins, new aeration basins, final clarifiers, and RAS pump station.

St. Louis MSD Storm Water Tunnels – St. Louis, MO. Estimator for pumps stations and piping off of the new storm water retention tunnel.

Ott/Story/Cordova Superfund Site, USACE-Detroit District – Muskegon, MI. Mechanical Estimator on lump sum contract for 1-mgd groundwater pump and treat system. Performed piping and equipment takeoff and labor, material, and equipment pricing for a complete self-performance mechanical bid.

Bofors-Nobel Superfund Site, USACE-Omaha District – Muskegon, MI. Mechanical Estimator on lump sum contract for groundwater pump and treat system.

Indefinite Delivery Indefinite Quantity (ID/IQ) Task Order Contract – Ft. Campbell, KY. Chief Estimator for various projects including site roads and bridges and M/E upgrades.

Jeff Kokal, P.E. – QA/QC Review

Lock and Dam No. 24 Lockwall Rehabilitation, USACE-St. Louis District – Clarksville, MO. Civil Engineer for site work including site plan, utility relocation plan, grading plan, and design of a sanitary grinder pump station.

Creve Coeur Lake Sedimentation Control, Missouri DOT – St. Louis County, MO. Performed HEC-RAS analysis of an existing channel between a 64-acre and 300-acre lake.

Disaster Recovery Program, Joplin Yellow Area CDBG-DR2 – City of Joplin, MO. Lead Technical Manager for the 90-Day Study of the "Yellow Area", consisting of 1.4 square miles.

F. Project Experience

Our team provides complete planning and engineering services in all engineering disciplines applicable to your project. The staff we have assembled has expertise in project management, planning, geotechnical, hydraulic and hydrology, structural, mechanical, and civil engineering. Jacobs' specialized expertise and experience includes value engineering, cost estimating and scheduling, environmental and hazardous material, wetlands delineation and mitigation, and public relations and stakeholder facilitation. We bring extensive experience in designing and constructing levees, relief wells, pump stations and gravity drains, floodwalls, floodgates and closure structures, and other flood protection system elements. Jacobs has successfully completed numerous flood protection projects and infrastructure improvements that involved coordination and consultation with agencies such as SEMA, FEMA, EPA, MDNR, and the USACE.

Nationally, we bring the best practices from our staff's involvement working under the intense environment of the **Katrina Relief** projects. We understand how to address and meet aggressive schedules while coordinating with all local stakeholders. *The Katrina Relief projects were not typical U.S. Army Corps of Engineers projects*. Our team delivered exceptional work while under intense scrutiny for quality of work, meeting schedules, and staying within budget.

We also delivered several successful flood protection levees in the State of Missouri. The **Riverport Levee** was designed, financed, constructed, and operated and maintained by Jacobs. The levee, designed to reclaim land from the Missouri River for an office/retail industrial park complex, provides 500-year flood protection for over 500 acres. At 8,800-ft-long and 22-ft-high with 82 relief wells, the Riverport Levee was one of only four Missouri River levee systems in Missouri that was not breached or did not fail during the 1993 flood. During that event, we supervised and coordinated 24-hour-a-day facilities inspections, temporary pumping plants, and pump station checkout and operation. The Riverport Levee was designed and constructed to USACE guidelines and requirements and FEMA certification requirements.

Jacobs provided engineering services for the **Monarch-Chesterfield Levee** (1993-2003) from post-1993 flood repairs, through 100-year levee improvements and recertification, 1994 and 1995 flood events, and 500-year levee improvements. The levee protects over 4,000 acres of mixed-use commercial/light industrial/retail development from the Missouri River and tributaries, including Interstate 64/Highway 40/61 and the Spirit of St. Louis Airport. The Monarch-Chesterfield levee system is one of the best examples of successful redevelopment, levee recertification, and increased level of flood protection following the devastation and damage of the 1993 flood. We provided engineering, design, and construction to the latest FEMA and USACE flood protection guidelines and requirements. Additional services and support provided include creative financing sources and mechanisms, city/levee district/ USACE/developer/landowner partnerships, and successful wetlands mitigation and cultural resource preservation efforts, resulting in cost-effective and timely advancement and completion of this project. Federal funding will be used to upgrade and complete construction of the last remaining closures and floodwall segments.

More recently, we completed the design and permitting of the **Premier 370 Levee** to protect 1,600 acres of proposed commercial development from the Mississippi River in St. Charles County. Design, permitting, and construction of the 500-year levee, which also protects portions of Missouri Route 370 and a major east-west railroad line, was completed under very stringent requirements and scrutiny. The Premier 370 Levee was designed and constructed to USACE guidelines and requirements and FEMA certification requirements.

Further details about our work on these and additional flood protection efforts are described beginning below.

	Premier 370	Green Brook	Katrina Recovery	Bannister Road	Riverside Kansas City	Monarch Chesterfield	Riverport	MO River WWTP
Hydraulic Modeling	■	■				■	■	
Underseepage Analysis & Cutoff Design	■	■	■	■	■			
Earthen Levee Design	■	■	■		■	■	■	■
Floodwall Design		■	■	■	■			
Rolling Gate Design		■		■	■			
Seismic Analysis	■	■	■			■	■	■
Global Stability and Seepage Analysis	■	■	■		■	■	■	■
Flood Control Drainage Structure Design	■	■		■	■	■	■	
Road Raise	■		■	■	■	■		
Interim Flood Protection Solutions			■			■	■	
Retaining Wall Design	■	■	■	■	■			
Maintenance of Traffic	■	■	■	■	■			
Pump Station Design	■	■					■	
Construction Estimates	■	■	■		■	■	■	■
Permit Assistance	■	■	■			■	■	■
Utility Crossing Design & Coordination	■	■	■	■	■	■	■	■

City of St. Peters Premier 370 Levee

The project consisted of developing approximately four miles of new levee to provide 500-year level of protection from flooding of the Mississippi River. It protects a 1,600-acre area of development along Missouri Route 370.

Phase 1 identified the recommended location of the primary levee. In order to investigate various levee alignment alternatives with respect to the existing floodway, we performed hydraulic backwater modeling of the Mississippi River and adjoining floodplain using HEC-RAS. According to USACE studies, the Premier 370 area is outside the Mississippi's floodway (the portion of floodwater with a current) and thus FEMA deemed the 1,600 acres as floodplain. Geotechnical investigations were performed to determine the levee embankment cross-section necessary to meet stability and underseepage requirements. Cost estimates for the levee construction and raising of a freeway ramp were developed. During the course of this study, we worked with USACE-St. Louis District to convert HEC-2 model data provided by the District and coordinate methodology with them. A final study report was prepared that describes the alternatives investigated and the recommended flood protection plan to be implemented. A "no levee" alternative was considered, in which the entire site would be filled, except for waterways and wetlands, to the 500-year elevation plus three feet. This would have required 34.2-million CY of fill material, compared to 2.5-million CY of material needed for the levee.

Phase 2 involved developing an Infrastructure Master Plan for the 1,600-acre tract of land, and performing preliminary engineering necessary to identify infrastructure costs associated with developing the land protected by the levee system. We conducted an Interior Drainage Study to identify the amount of real estate needed to provide for storm water retention. These areas store and attenuate runoff from the protected area and the adjoining uplands until it can be drained through the levee via gravity outlets or by pumping.

In order to identify the volume requirements and preferred location for storm water detention facilities and pump stations, we performed hydrologic modeling of the development area and the adjacent uplands. We used the Interconnected Pond Routing (ICPR) computer program to model unsteady and reverse flow conditions within the development area. Existing drainage culverts under Route 370 were used-in-place as part of the development drainage system, and the proposed detention and conveyance systems were planned in light of these constraints.

Approximately 140 acre-feet of detention storage was recommended upstream of the Route 370 culverts. Peak flows will be attenuated by the detention site before continuing downstream to the levee gravity outfall structure or the primary pumping station. We estimated a pump station capacity of 270 cfs (120,000 gpm) to discharge flows over the levee during high river stages.

Phase 3 included final design and preparation of construction documents for levee, storm water pump stations, and appurtenances; an engineering study to investigate alternate means of flood protection along Spencer Road; and hydraulic modeling of Spencer Creek.

The 4.1-mile-long, 25-ft-high urban levee system includes:

- 120,000- and 43,000-gpm pump stations for removing interior drainage when flood conditions occur.
- Forty relief wells at locations without seepage berms.
- A gravity structure (box culvert) through the levee at the pump station site to provide for interior drainage during low "non-flood" river/creek conditions.
- Cave Springs Road improvements to adjust the vertical alignments where the levee crosses existing roadway.

Recommendations were provided for each of the following:

- Foundation for the proposed pump stations and closure structures.
- Stability analysis per USACE guidelines for the anticipated levee sections using UTEXAS3.
- Seepage analysis for underseepage beneath the proposed levee sections. Includes design of seepage berms and relief wells if required at the pump station locations per USACE guidelines.
- Soil material and compaction requirements for levee fill, construction backfill, and for the support of structures and pavements.

We assisted the City with Section 404 Permit from USACE and Section 401 water quality certification from MDNR. During final design, we coordinated with other agencies and stakeholders including EPA and Norfolk & Southern Railroad. On behalf of the City of St. Peters, we submitted documentation to the Federal Emergency Management Agency (FEMA) for a Conditional Letter of Map Revision (CLOMR) to revise the floodway boundary at the project site. The CLOMR was subsequently approved by FEMA.

USACE Green Brook Flood Risk Management

The Green Brook Sub Basin of the Raritan River Basin is located in north-central New Jersey. It encompasses 13 municipalities and drains approximately 65 square miles of primarily urban and industrialized area. The USACE-New York District is involved in a long-term project to provide

comprehensive flood protection and improve public health and safety.

Jacobs' team provides design and engineering construction support services in our segments for the following:

- 2,450 feet of concrete floodwall.
- 230 feet of earthen levee. The levee crown is 10 feet wide and the side slopes are 1V:2.5H. The crown is paved with asphalt allowing maintenance vehicles to drive on it.
- A road closure (gate) across NJ Route 28 to close the 58-ft opening in the floodwall.
- Internal drainage to convey stormwater runoff through the levee/ floodwall and into Bound Brook via drainage structures.
- Internal drainage to convey runoff to a pump station to lift the water over the floodwall and into Bound Brook when the drainage structure valves are closed during flood events.
- Pump station developed using a HEC-HMS model to calculate the amount of stormwater draining along the swales and through the pond storage areas.

City of Washington WWTP Expansion

Jacobs performed a capacity analysis and evaluated Washington's existing wastewater treatment plant, which was more than 40 years old. Our study team determined that the old plant had inadequate capacity to meet these challenges and needed to be expanded. We investigated various alternative treatment schemes.

The most cost-effective site was immediately adjacent to the existing WWTP; however, it lies in a floodplain and is subject to FEMA deed restrictions.

One task involved evaluating sites for the new facility, and each potential site presented unique challenges. Issues such as flood protection, wetlands mitigation, brownfield cleanup, Federal Emergency Management Agency (FEMA) deed restrictions, utility easements, and obstructed site access influenced the site selection process.

We assisted the City with an Application for Assistance for the State Revolving Fund (SRF) Program to MDNR, including obtaining appropriate project clearance letter for the 4-mgd WWTP expansion required as part of the SRF application.

We provided locations and field observation of geotechnical test borings for the pipeline alignment, jacking pits for a Union Pacific Railroad crossing to install a 48-inch-diameter steel casing pipe via trenchless technology to house multiple pipeline and cables, and wastewater treatment plant structures. Based on laboratory testing to evaluate the subsurface materials, we furnished a report of recommendations for use during structural design and bidding.

USACE New Orleans Flood Protection

The USACE-St. Louis District and Jacobs are responsible for protection in reach LPV-101 (Orleans Parish Lakefront Levee) along the Pontchartrain lake front. The existing protection system consists of earthen embankments (levees) on the east and west ends of the reach and concrete floodwalls in between. The existing floodwall is a combination of I-wall, L-wall, and T-wall. There are six vehicular gates through the line of protection and one pedestrian gate.

The existing top of protection is approximately EL 12.5. The required protection level varies between EL 16.0 for floodwall and EL 18.5 for earthen levee. The recommended approach for providing the required protection levels for a 100-year event (factoring in subsidence over the next 50 years) is to replace existing walls (I, L, and T) with new T-walls, and to construct new L-walls on top of the existing levees at the east and west ends of the reach.

Our services to the USACE include:

- Conduct archival searches for contract documents depicting existing protection system construction.
- Site reconnaissance and field data gathering.
- Protection type, alignment, and crossing alternative analyses.
- Conceptual and preliminary design.
- Prepare Preliminary Engineering Reports (PER), Comparative Alternative Studies (CAS), and Engineering Alternative Reports (EAR).
- Perform final design and prepare contract documents for construction.
- Produce right-of-way documents.
- Identify and coordinate utility relocations with utility owners.

Our technical design services include:

- Evaluate undisturbed boring, cone penetrometer, and laboratory test data to determine geotechnical parameters for levee and floodwall design.
- Prepare geotechnical reports.
- Seepage analyses for levees and floodwalls.

- Geotechnical global stability analyses for over 3,500 linear feet levees and floodwalls.
- Structural design of 3,500 linear feet of reinforced concrete floodwalls founded on piles. (Wall type on top of the levees to be determined.)
- Design for civil site, alignment, grading, and drainage.
- Cost estimating.
- Construction scheduling.

We prepared materials and made presentations for technical design charrettes, stakeholder meetings, and public involvement meetings. During the design process, we participate in independent technical reviews and value engineering reviews.

USACE Lake Wappapello Roadways

As a task under an indefinite delivery contract with USACE-St. Louis District, we developed plans, specifications, quantity takeoffs, and cost estimates for six county road and bridge improvement projects at Lake Wappapello, a large recreational area and state park in Missouri. These roads were being adversely affected during high water conditions by the operation of Lake Wappapello. The task entailed relocating and raising the profile of the county roads while still maintaining traffic. Project included a 12' x 9' reinforced concrete box structure.

Granite City WWTP Improvements

The Granite City (IL) Regional Wastewater Treatment Plant (GCRWWTP) treats high concentrations of industrial waste, along with wastes from combined storm and sanitary sewers. The plant provides treatment for both dry weather flow and wet weather overflows. We have provided a series of innovative and cost-effective design improvements to the 23-mgd facility over the past 20 years.

During high river stage, the Depot Pump Station is critical for pumping wastewater treatment plant effluent, which during wet weather includes large volumes of effluent from the combined sewer overflow treatment units. The USACE turned over operation of this pump station to the City in 2000. To upgrade capacity and operability, we prepared cost estimates and technical information including performance curves for a "basic" pump installation and for an "enhanced" pump installation at the DPS. Considerations included a 200-Hp vertical turbine pump, VFD, emergency generator, and alternate power source. Following discussion with USACE and the City regarding the necessary level of improvements and receipt of a grant from the Corps towards both construction and operating costs, we provided design, bid phase, and construction phase services for the addition of a 20-mgd pump, VFD, and emergency generator.

St. Louis MSD Missouri River WWTP

Following the record-setting Great Flood of 1993, in which floodwaters breached levees and infiltrated the system causing the plant to shut down, we assisted MSD restore and restart the treatment plant. Work included a facility assessment, a condition survey of treatment facility as well levees, roads, structures, M/E systems, and buildings to develop recommendations for repairing/replacing plant equipment, development of a plan and schedule to clean-up and repair equipment needed for initial operation, and development of a plan and schedule for complete restoration of the treatment facility.

Associated with this work was design of a new outfall to the Missouri River and design of 500-year flood protection for the plant including 4,000 feet of levee improvements and three road raises over the levee. We designed and detailed a 300-ft-long reinforced concrete floodwall with an average height above grade of 8 to 9 feet that was supported on auger cast grout piles. We also provided construction phase services during the restoration work.

Missouri River Flood Protection

This civil works project involved design services for major flood protection facilities for the Missouri River Levee System (Unit L-385) located near Kansas City at Riverside, MO. Our responsibilities involved many diverse tasks: preliminary and final design, specifications, quantities, and MCACES cost estimates for the following project features as designed:

- 6.2 miles of levees with seepage berms, designed for 500-year Urban Design Flood plus three feet of freeboard, including 2.5-million CY of hydraulic dredge material.
- 1,700 feet of floodwall on auger cast pile foundations, with an average height above new grade of nine feet.
- Six rolling gate closure structures at openings in the levee, two being at railroad crossings, heights vary from 8 to 17 feet. Closure response time studies with water running

through the gap are also included. Rolling gates are a horizontal truss type of closure structure, capable of being closed while water is flowing through the levee openings.
- One aluminum stoplog closure in levee system at joint use road and railroad access.
- Channel improvements and relocation for 0.5 miles of Line Creek, including four channel control sheetpile drop structures.
- Eight gatewell structures with sluice gates.
- Grading plans for two storm water pump station locations.
- Road raise over levee for outer roadway adjacent to Highway 9.
- Geotechnical analysis for levee, underseepage, floodwall and closure structure foundations, and dredged materials.

Bannister Road Flood Protection

Project involved design of major flood protection facilities for the Federal Complex on Bannister Road for USACE-Kansas City District. All of the flood protection work conformed to USACE design guidelines.

Jacobs' responsibilities included preliminary and final design, specifications and quantities, and engineering assistance during construction for the following features:

- 2,500 LF of new floodwall on auger cast pile foundations, with an average height above grade of 12 feet. Architectural aesthetics was a major concern over the entire length of the floodwall – the USACE was very pleased with the results.
- One swing gate and four rolling gate closure structures across openings in the floodwall. Swing gate opening width is 12 feet and rolling gate openings vary in width from 60 to 90 feet. Height of gates is approximately 12 feet. Minimal response time and proper sealing techniques are critical in the operation of the rolling gate system. Typical Rolling Gates are L-frame type closure structures with hooks anchoring into the foundation.

- Two aluminum stoplog closure structures and one rolling gate closure structure across openings in the levee system provided for railroad access. Work included coordination with railroad concerning design and construction requirements. Existing structures at gap locations were evaluated for possible modifications to satisfy updated project flood criteria and found to be deficient.
- Jib cranes to handle stoplogs at railroad stoplog closures.
- Two aluminum stoplog closure structures at vehicular openings in the levee system. Width of openings approximately 60 feet and 90 feet, and height above grade approximately 8 feet.
- Two new gatewell structures – one double chamber and one single chamber – both with sluice gates.
- Modifications to five existing gatewell structures to satisfy updated project flood criteria.
- Interior drainage structures.

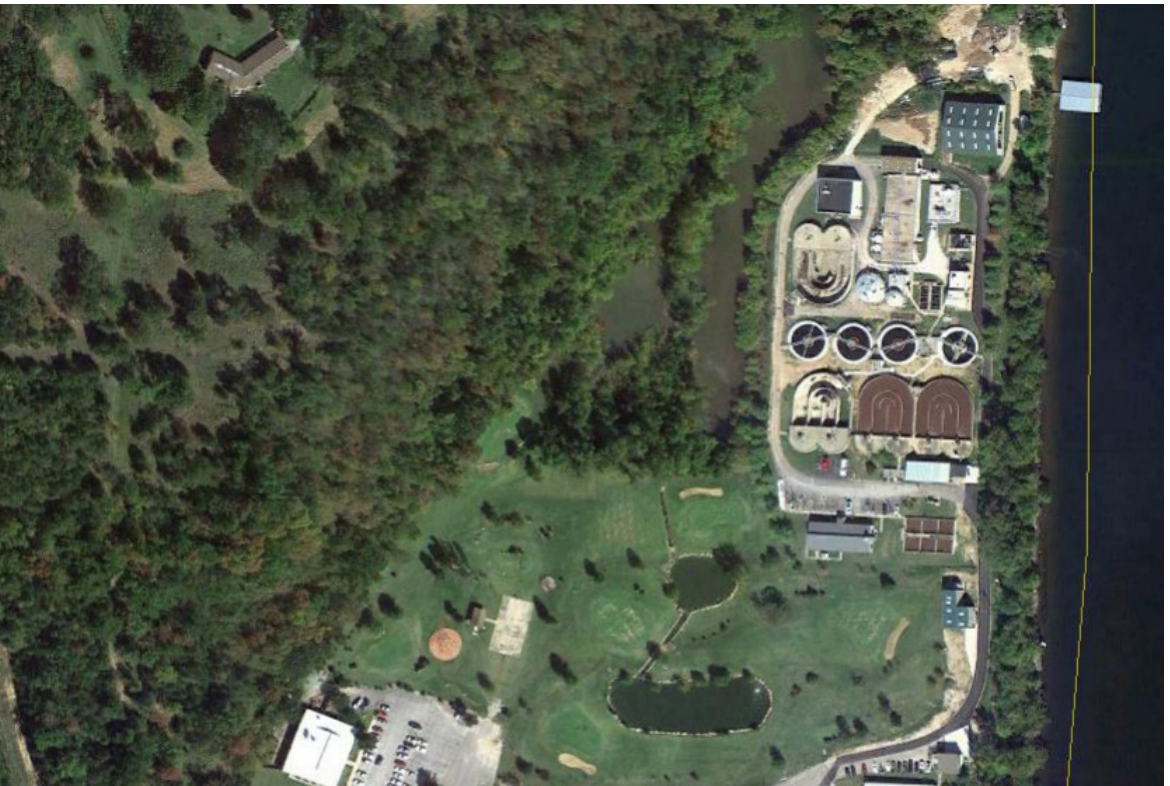
USACE-St. Louis District Multiple Contracts

Jacobs provided engineering services including flood protection, lock and dam design and rehabilitation, and design services under numerous task order contracts for USACE nationwide. Work with the St. Louis District included:

- Study to select a minimum of five possible alternative methods for carrying discharge water from the proposed Afton Pump Station to the existing gatewells. Developed final plans and specifications for selected method.

- Final design for the spur dike access road gravity drains as part of the Lock & Dam No. 26(R) project.
- Develop final design construction PS&E for over four miles of rechannelization work for Canteen Creek in Southern Illinois. Required close coordination with District staff, EPA personnel, and the Illinois State Historic Preservation Organization because the project limits were within wetland and archeologically significant areas.
- Concept study for evaluating numerous alternative levels of protection by levee raises as part of the USACE's Environmental Management Program (EMP).
- Assist District develop a Reconnaissance Report for new ditches and pump station for the Wood River Drainage and Levee District in Madison County, IL.
- Inspect and prepare report for vibration problems with the North Pump Station in East St. Louis, IL.
- Inspect pump station (including operations and testing) and reports at 62 locations within District boundaries.
- Develop drawings for a series of rock dikes at Pharrs Island Wetland Habitat Rehabilitation, Pool 24.

JACOBS



www. jacobs.com

CITY OF BRANSON, MISSOURI

ENGINEERING STUDY FOR THE COMPTON DRIVE WASTEWATER TREATMENT PLANT FLOOD PROTECTION IMPROVEMENTS

MARCH 11, 2016

OLSSON ASSOCIATES

CELEBRATING 60 YEARS

March 11, 2016

David H. Miller, City Engineer
City of Branson
110 W. Maddux, Suite 310
Branson, Missouri 65616

Re: Engineering Study for Compton Drive Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Miller and Selection Committee Members:

No one can predict what Mother Nature will do. The best anyone can do is design infrastructure improvements with safeguards to the best of our ability and use all available technology and historical data. Even then, Mother Nature goes above and beyond anything seen in history to test our designs, just like what happened a few months ago in Branson. Excessive rainfall flooded the Branson Landing and rose dangerously close to the top of the Compton Wastewater Treatment Plant, creating a potential wastewater spill into Lake Taneycomo. Having witnessed Mother Nature's latest challenge, Olsson Associates (Olsson) stands ready – equipped with intimate knowledge of the wastewater plant's original design and subsequent improvements, a vast bench strength of technical experts, as well as a local presence capable of being on site within 40 minutes - to step in and design necessary improvements to safeguard the Compton Wastewater Treatment Plant against future extreme rainfall events.

Our team offers the following benefits:

- **Project management.** With 18 years of stormwater experience and located in our Springfield Office, Nathan Meyer, PE, CFM, will lead as Project Manager for this project. Chad Johnson, PE, CFM, will work closely with Nathan and serve as the Lead Engineer, providing senior technical leadership, leaning on his deep project experience with levees, floodplain management, hydraulic and geotechnical engineering, many of which are similar to this project and are highlighted herein. Our team's project management will be streamlined, heavily cross-coordinated, and checked to identify areas where multiple comments need to be combined, clarified, or may even cause a red flag when considered as part of the whole.
- **Effective communication.** Olsson will consistently keep open lines of communication and methods for effective coordination with the City of Branson. Having worked on numerous projects since 1980, our team members already understand the Ozark topography and the city's expectations and guidelines. Our established professional relationship with key staff members will benefit overall coordination and enhance efficiency for the entire project.
- **Expert technical resources.** Designing a sustainable flood levee will involve numerous engineering disciplines – all available under one roof at Olsson Associates. Our technical experts have many years of experience designing levee projects all over the Midwest and will utilize their multiple years of design and review experience to help identify potential issues related to constructibility and O&M. Olsson's professional engineers are adept at assessing stability, seepage, settlement issues, and are also familiar with hydrologic and hydraulic modeling of Lake Taneycomo. To further bolster our team, we are offering the services of Tom Boyce as a constructibility expert. Mr. Boyce is a Branson native who is very experienced with numerous projects in and around the City of Branson, namely the Branson Landing. As a well-known, respected excavation contractor, he can provide critical review during the design and construction process of this levee.

Olsson's Springfield office has 42 professionals who offer a wide range of engineering, planning, landscape architecture, surveying, and construction management services. These staff members are supported by 25 other offices that employ nearly 950 staff members. We believe Olsson's clients appreciate the attention and responsiveness of a small local office along with the vast resources of a large, nationally established company. We want the best for the city of Branson because the Ozarks is our home, too. Who better to provide those services than local residents who live, work, and play in the same backyard. Olsson appreciates the opportunity to submit our proposal for your consideration. Should you have any questions, please contact me at 417.890.8802 or nmeyer@olssonassociates.com.

Sincerely,

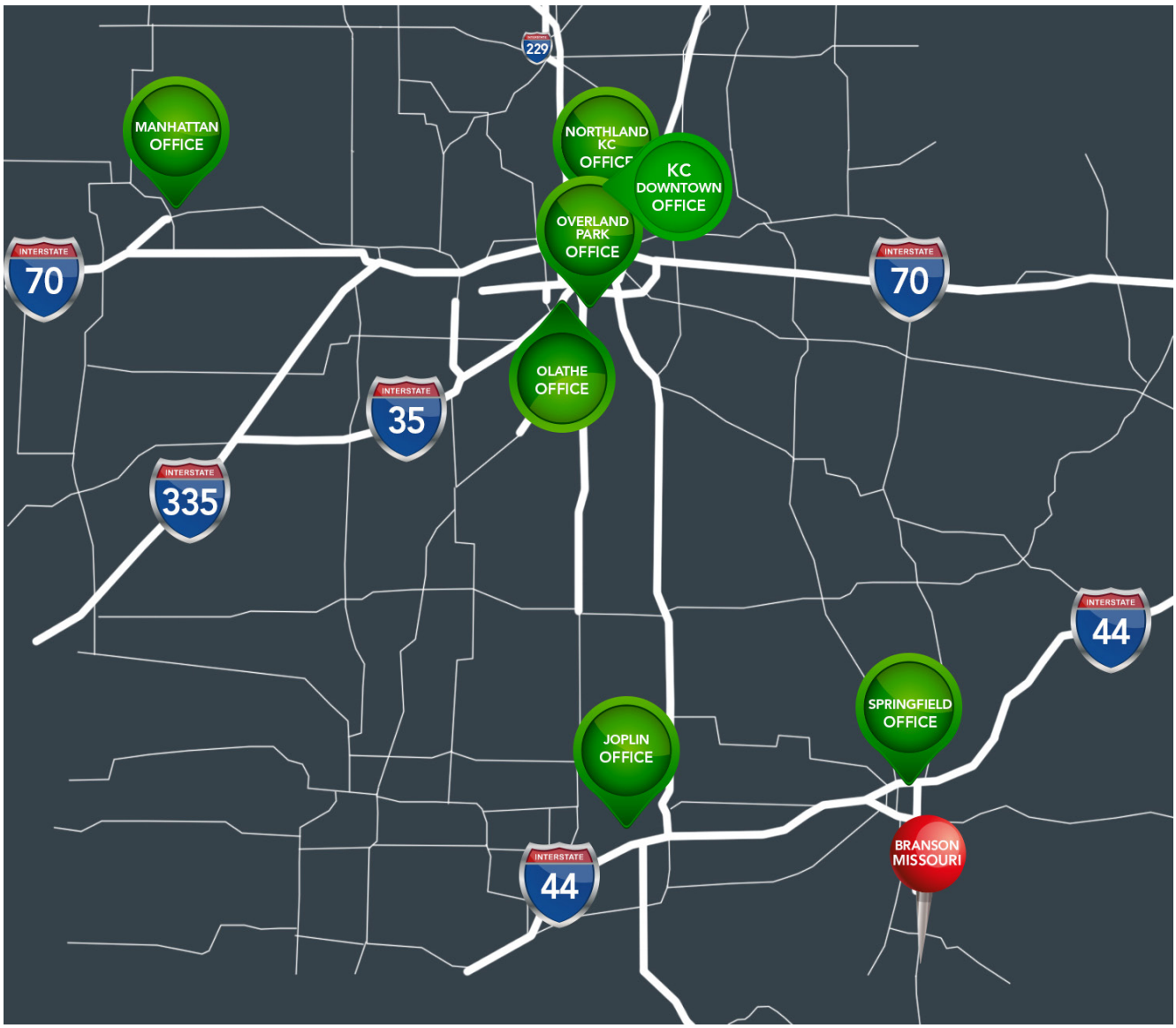
Nathan Meyer, PE, CFM | Project Manager

550 St. Louis Street
Springfield, MO 65806
TEL 417.890.8802
FAX 417.890.8805
www.olssonassociates.com

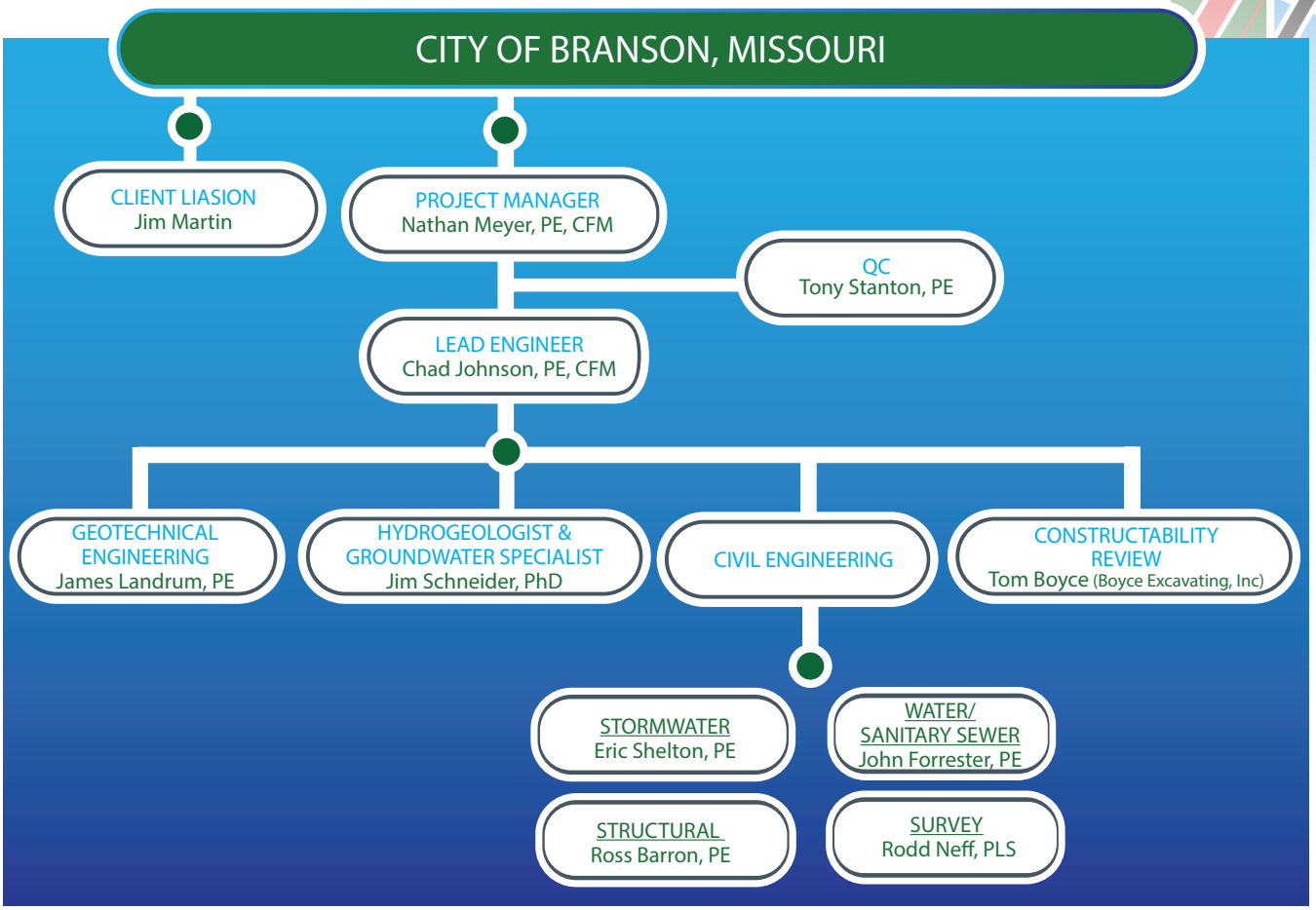
CLOSE PROXIMITY

Conveniently located approximately 40 minutes from Springfield and a little more than three hours from Kansas City, Olsson's project team is well positioned to serve the City of Branson efficiently and cost effectively. Technical support will be provided from our Overland Park, Olathe, and Lincoln offices, as needed. With 26 offices across the Midwest, Olsson's ability to access additional resources and technical experience is quite extensive and invaluable to our clients.

This project will be managed by Nathan Meyer, a stormwater project engineer with over 18 years of project management, design, and review experience. Nathan is based in Olsson's Springfield office and is available 24 hours a day, 7 days a week. He will work closely with project team members to ensure the City of Branson receives the attention and service it requires.



Personnel Qualifications



NATHAN MEYER, PE, CFM - PROJECT MANAGER

Nathan brings experience in civil and structural engineering services for a variety of stormwater and building projects. He has experience as the lead design engineer and project manager for several land development and water resource projects involving public and private storm conveyance systems, watershed modeling, site grading, detention facilities, and water quality BMP design.

CHAD JOHNSON, PE, CFM - LEAD ENGINEER

Chad has 18 years of experience in the areas of water resources and geotechnical engineering. Chad is a senior engineer on Olsson's Water Resources Team and has led efforts on preliminary engineering studies, levees, FEMA floodplain studies, and permitting, and preparation of construction documents. He has provided lead design and project management for a number of stormwater improvements, hydrological/hydraulic studies, and BMP practices, including Bowersock Mills Hydropower Dam, Wildcat Creek Lift Station Flood Protection, and North KCMO Paseo Industrial District Flood Protection.

TONY STANTON, PE - QUALITY CONTROL/QUALITY ASSURANCE ENGINEER

Tony has more than 19 years of experience as a consulting engineer. As the Water Resources Practice Leader for Olsson, Tony is responsible for business development, large project management, strategic planning and quality assurance. Tony's key areas of expertise include watershed management; lake, stream and wetland restoration; dam rehabilitation; urban flood control and stormwater management; NPDES compliance; stormwater drainage policy and criteria development; and best management practices for water quality. Tony has also served in leadership roles for the Kansas City Chapter American Public Works Association and the Engineers Club of Kansas City.

JIM MARTIN - CLIENT LIAISON

Jim Martin, a longtime Branson resident, will serve as Olsson's Client Liaison. His past experience representing the city and his personal relationships with city staff members ensure that project-related information, comments and concerns of every kind will flow smoothly and quickly in both directions. Jim's experience working with public-sector projects, being a steward of public monies, combining his design, engineering and construction experience with proven financial acumen, is second-to-none in the business. His vision and constant awareness of the "big picture" helps streamline the entire process for all, which often results in the savings of schedule and/or budget.

JAMES LANDRUM, PE - GEOTECHNICAL ENGINEER

James serves as a technical leader of Olsson's Geotechnical Services and has 18 years of experience in geotechnical engineering, including design of dams and levees and performing uplift and under seepage calculations related to levees and dams. He has worked with the United States Army Corps of Engineers and various levee districts and will provide quality assurance reviews of the geotechnical aspects of the project.

ROD NEFF, PLS - LAND SURVEY MANAGER

Rod has 25 plus years of experience and leads Olsson's Land Survey team in the Springfield, Missouri office. He performs all aspects of surveying, including boundary and topographic surveys, easements, and construction surveys utilizing the latest technologies in Robotic Total Stations and GPS. His responsibilities range from the preliminary phase through the completion of the project. Rod served as the manager and/or lead surveyor on many small and large municipal and private land surveying projects throughout his career.

JOHN FORRESTER, PE, CFM - WATER/SANITARY SEWER ENGINEER

John has 35 years of experience on a variety of complex projects for both municipal and industrial clients dealing with environmental issues. His experience includes all aspects of projects from initial study and planning through design and construction coordination. John played a major role in designing the Compton Wastewater Treatment Plant in the 1980s.

ERIC SHELTON, PE, CFM - STORMWATER ENGINEER

Eric has performed hydrologic and hydraulic analyses for the design of storm sewer systems, bridges, culverts, open channels, stormwater reservoirs, regional detention basins and water quality BMPs. Eric has performed floodplain mapping and floodplain permitting on multiple projects aimed at modifying existing FEMA regulatory maps. Eric specializes in hydraulic design for the development of construction plans related to stormwater conveyance and flood reduction projects.

ROSS BARRON, PE - STRUCTURAL ENGINEER

Ross has worked on a variety of projects involving many types of materials and structural systems. He has served in the roles of project manager and lead engineer for various public and privately funded improvement projects focusing on bridge engineering, construction, and evaluation. In addition to bridge design, Ross' experience includes significant concrete drainage structures and wastewater treatment plants, as well as building structures.

JIM SCHNEIDER, PHD - HYDROGEOLOGST & GROUNDWATER SPECIALIST

Jim's role as a senior scientist involves performing high-level analyses, making recommendations, and coordinating with clients. Prior to joining Olsson, Jim served as the Nebraska Department of Natural Resources' (NDNR) Acting Director from December 2014 to August 2015 and Deputy Director from 2010 to 2014. His responsibilities involved advising and assisting the director in formulating and administering department policies,budgets, organizations, and work assignments. Jim also oversaw the work of consultants and prepared special reports related to surface water or surface and groundwater interactions.

Relevant Experience

Compton Drive Wastewater Treatment Plant Expansion and Improvements *Branson, Missouri*

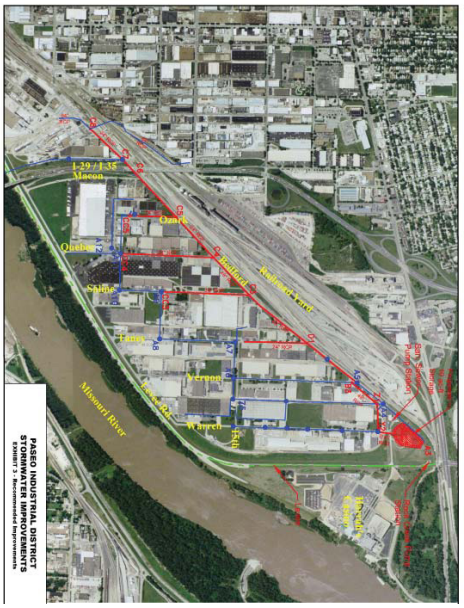
In 1985, the City of Branson engaged Olsson Associates to evaluate options to treat the total suspended solids effluent (single cell algae) from the existing aerated lagoon/filter wastewater treatment system which exceeded discharge limits. Five viable options were thoroughly evaluated and resulted in the design and construction of a 2.5 mgd wastewater treatment plant. Due to the regulatory agencies, Environmental Protection Agency and the Missouri Department of Natural Resources' strict timeline for completion, the entire plant design was completed in three months. The plant was designed to be expandable to accommodate future potential growth that loomed on the horizon. Sludge by product was thickened by gravity then stabilized and stored in an aerated sludge holding basin followed by land application. Odor control facilities were incorporated on the influent pumping station and both sludge processing steps.

In 2009, the City of Branson selected Olsson to design peak flow treatment capacity improvements. The work included conducting a detailed evaluation of the peak capacity of the existing clarifiers and designing an upgraded influent pump station screening structure, clarifier improvements, septage receiving facilities, SRT control improvements, and covers for the existing grit and grease removal and filter structures. The project also involved developing a facilities plan for the Compton Drive Wastewater Treatment Plant. The plan included evaluating the capacity, determining treatment alternatives, and evaluating the needed improvements, including developing a Capital Improvements Plan for the needed capacity increases.

Bowersock Mills & Power Company North Lawrence Generating Station *Lawrence, Kansas*

Olsson Associates completed design work for the Bowersock Mills and Power Company associated with expanding the capacity of the existing hydroelectric plant located along the Kansas River in Lawrence. The existing plant lies along the south bank of the Kansas River north of downtown Lawrence, and there is an associated dam spanning the Kansas River that has been in use for over 100 years. The expansion included the installation of a new building and hydroelectric turbines along the north bank of the River on the riverside of the levee.

The initial hydraulic analysis included design of the building to pass high flows with a no-rise in the 100-yr event to protect the Lawrence levee system. The modeling also included analysis of differing pool elevations behind the dam that vary based on the use and placement of flash boards along the top of the dam. Additional modeling was completed to assess the impact of dam failure on water intakes for the City of Lawrence and for a power generating facility approximately one mile upstream. This included modeling and assessment of impacts on two intervening bridges and the Lawrence levee.



North Kansas City Paseo Industrial District *Kansas City, Missouri*

Frequent localized flooding in the Paseo Industrial District of North Kansas City, Missouri, was hindering the district's ability to carry on normal business functions. The 375-acre industrial warehouse district has a high volume of truck traffic and businesses depending on vehicle access to ship their products. However, the levee protected had limited storm sewer capacity, and there were several locations with no storm sewer system, nor natural overflow outlets. As a result, the area encounters street flooding several times a year, inhibiting access to local businesses and restricting through traffic. Olsson Associates was retained to help solve the problem.

The project, completed in 2008, began with a preliminary engineering study (PES) to evaluate the existing system and determine the most cost-effective approach to resolve the flooding problems. At the outset, it was determined that the area's extremely flat grades and minimal levee penetrations as outlets would require a modified design evaluation. Olsson and city staff members decided to rate solutions based on reduced flooding in a one-year storm. XP-SWMM, a software tool for stormwater design, was used to evaluate five alternatives and rate them based on the reduced flooding benefits compared to costs of each alternative.

Based on this evaluation, a solution was chosen that will reduce the time areas are flooded by 75 percent in a one-year storm. The project included the installation of 13,000 linear feet of storm sewer ranging in size from 18-inch reinforced concrete pipe to 8-foot by 4-foot reinforced concrete box, constructing 50 drainage structures. The design plans included coordination with the railroad, Missouri Department of Transportation, and utilities with facilities in the area.

Levee Feasibility Study *Clarkson, Nebraska*

Olsson was hired to complete the detailed levee feasibility evaluation, which is the next step in the certification process. Olsson and Barr Engineering completed a detailed hydrologic and hydraulic analysis, interior drainage and uncertainty analysis, detailed alternatives and feasibility analysis, geotechnical investigation and laboratory testing, and geotechnical engineering analysis.

The goal for the City of Clarkson is to ultimately have a certified levee. Five alternatives were identified and evaluated to determine the feasibility of each one to meet both the USACE standards and FEMA regulations. Through the comparison of each of the five alternatives, the City of Clarkson selected a flood reduction alternative that meets freeboard requirements by lowering flood elevations of the West Fork of Maple Creek in the levee reach. This approach was described as "innovative" and "clever" by staff members at the Omaha District of the USACE during meetings with the project sponsor and Olsson Associates. The flood reduction alternative eliminates the need for a major 408 submittal because the levee is not being substantially altered. The flood reduction alternative also avoids work in the channel of the West Fork of Maple Creek, thereby limiting impacts to "waters of the United States" and minimizing Section 404 permitting requirements.

Additional Project Experience - *On Time, Within Budget*

PROJECT	LOCATION	ORIGINAL CONTRACT FEE	FINAL CONTRACT FEE	COMPLETED ON-TIME?
Missouri River Levee	South Sioux City, NE	$88,850	$66,276	YES
SID 7 Whitetail Lake Levee Certification	Columbus, NE	$95,260	$95,260	YES
KDA Department of Water Resources - Levees	Various Locations, KS	$448,775	$327,771	YES
Lamar, CO Levee Certification	Lamar, CO	$56,510	$51,036	YES
LPSNRD BNSF Railway Salt Creek Levee Repair	Lincoln, NE	$5,644	$3,597	YES
Phase I Feasibility Study of Levee Accreditation	Fairbury, NE	$45,000	$37,200	YES
LPSNRD Salt Creek Levee Encroachment Repair	Lincoln, NE	$20,200	$20,200	YES
Coastal Energy Hydraulic Analysis & Conceptual Levee Layout	Willow Springs, MO	$29,500	$46,500*	YES
Wildcat Creek Lift Station Flood Protection	Manhattan, KS	$110,087	$169,260*	YES
LPSNRD Salt Creek Levee Drainage Structures	Lincoln, NE	$210,250	$210,250	YES

Fee increased because additional scope was added.

Firmwide staffing capabilities:

Service Category	*Total Staff*
Biologist	16
CADD Technician	104
Civil Engineer	93
Construction Inspector	5
Construction Manager	12
Electrical Engineer	22
Environmental Engineer	8
Environmental Scientist	44
Geotechnical Engineer	13
Geologist	10
Hydrologist	1
Land Surveyor	58
Landscape Architect	18
Mechanical Engineer	9
Other Employees	97
Planner: Urban/Regional	9
Sanitary Engineer	11
Structural Engineer	19
Technician/Analyst	124
Transportation Engineer	59
Water Resources Engineer	37
Administrative	178
TOTAL EMPLOYEES	949

The availability of qualified staff members is an important factor when deciding on the right consulting firm to hire for your project. We have carefully reviewed our workload to ensure that we can meet or exceed your desired project schedule, and can commit the necessary staff members to complete the outlined project. **The staff members presented on the previous pages are available to begin work immediately upon notice to proceed.**

We understand the city's desire to have an accessible project manager who is knowledgeable on this type of project. Nathan Meyer will be the point of contact on this project and will be involved in every aspect of your project. He is a responsive, organized project manager who will pay careful attention to the budget and schedule of your project, ensuring that your priorities are also the project team's priorities. He will be assisted by highly qualified professionals who have worked on numerous projects throughout the Midwest. With the Olsson team, you get the best of both worlds: an attentive project manager, and the depth and breadth of technical expertise needed to be your partner. Branson staff members will also have immediate access to our local supplemental team members and our national experts.

Springfield office staffing capabilities:

Service Category	Total Staff
CADD Technicians	5
Civil Engineers	5
Land Surveyors	3
Landscape Architects	2
Sanitary Engineers	4
Transportation Engineers	2
Technician/Analyst	5
Water Resources Engineers	2
Construction Inspectors	5
Transportation Technical Manager	1
Administrative Staff Members	8
TOTAL EMPLOYEES	42

Kansas City office staffing capabilities:

Service Category	*Total Staff*
CADD Technicians	19
Civil Engineers	15
Land Surveyors	6
Mechanical/Electrical Engineers	10
Landscape Architects	9
Geotechnical Engineers	3
Structural Engineers	3
Sanitary Engineers	2
Transportation Engineers	16
Water Resources Engineers	4
Technician/Analyst	5
Planners: Urban/Regional	4
Other Employees	17
Administrative Staff Members	23
TOTAL EMPLOYEES	**132**

Proposed Schedule

Task Description	Apr	May	June	July	Aug	Sept	Oct
Interim Flood Protection Measures							
Initial Site Visit and Reconnaissance							
Review of flood fighting materials on-hand (sandbags, pumps, shovels, etc.)							
Review Emergency Action Plan							
Interim Flood Protection Recommendation and Plans							
Prepare sandbag plans/exhibits							
Determine pump requirements for groundwater seepage							
Present Recommendations to City for Immediate Implementation							
Long Term Permanent Flood Protection Study							
Data Collection							
Topographical survey							
Geotechnical borings							
Develop Design Criteria							
Groundwater transmissibility study							
Review FEMA & USACE hydraulic modeling							
Review wastewater valves and pump capacity							
Recommend Design Criteria to City							
Develop Design Alternatives to Address Flooding (Surface and Seepage)							
Prepare Cost Estimates for Implementation and Maintenance							
Present to City Recommendations							

Project Approach

Olsson's history working with the City of Branson on the Compton Drive Wastewater Treatment Plant extends back decades to the mid 1980's with the design and construction of the first expansion to the original treatment facilities. In 2009, we again provided engineering services for capacity upgrades to the system. Key engineering personnel involved with each of these projects ***remain on staff with Olsson Associates*** today and are available to provide valuable insight into the history as well as the future of this facility. Our team brings a unique perspective and efficiency to this project by having a historic knowledge of this site along with a vested interest in helping you protect this facility and the community.

Recent evidence of increased frequency and intensity of rainfall suggests that climate changes will continue to create challenges for the properties located along Lake Taneycomo. Revisions to mapped floodplain boundaries and elevations have occurred as recently as 2012, reflecting the increased flooding risk to properties in this area. Facilities such as the Compton Drive plant, that were originally built with flood protection that was appropriate at the time of construction, are now placed in the difficult position of having to upgrade to a higher level of protection. The location of the treatment plant in the shadow of nearby Table Rock Dam significantly increases its vulnerability to flooding as release rates at the dam are likely to increase with continued development in the basin and changes in the climate.

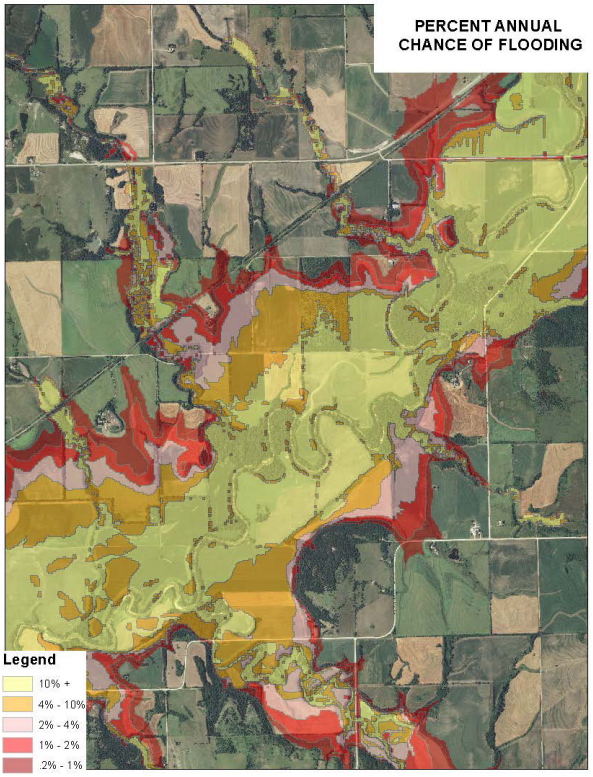
The project area is susceptible to flooding from two modes of entry:

- Surface flow over the top of the existing levee
- Seepage of subsurface flows below the levee

Development of solutions to manage these two sources of flooding will be the central focus of this study. The Olsson Team has formulated a project approach focused on developing comprehensive solutions to these stated goals and other areas of interest as further defined in the following sections.

SURFACE FLOW – FLOOD PROTECTION (RFP ITEMS 1-5, 7-9)

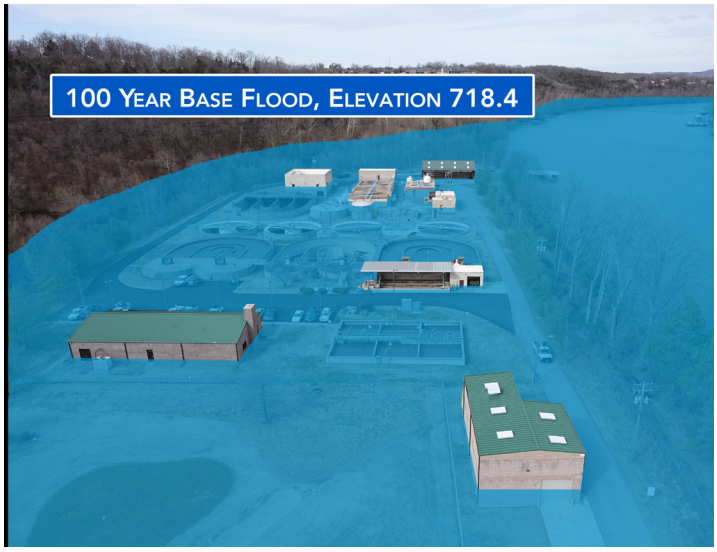
Initial review of the 2012 Taney County Flood Insurance Study, along with previous survey data at the site, indicates that the existing levee flood protection system is 3 to 4 feet below the current 100-year flood elevation and approximately 23 feet below the current 500-year flood elevation. Flooding along the White River is significantly impacted by regulation of releases from Table Rock Lake and, to a lesser degree, Lake Taneycomo by the U.S. Army Corps of Engineers (USACE). Proposed improvements for flood protection at the site will require analysis of the current USACE operational protocols in addition to identifying trends or reasonable assumptions for future operational changes. Flood protection from events greater than the 100-year event, including the 500-year event and maximum probable release at Table Rock Dam, likely exceed the limits of reasonable flood protection measures at the current location. Our study will identify and quantify the envelope of potential flood protection measures, along with their associated costs and protection levels, to ensure the city employs the most cost effective solutions while having information to demonstrate the appropriateness and viability of the recommended solution to the public at large and funding decision makers.



Olsson utilizes various technologies to both give a real-world check to our flood modeling and provide clarity and understanding for the public. Below are two examples. The image above shows a color-coded floodplain of varying flood risk within a floodplain that Olsson completed for the State of Kansas under our floodplain mapping contract. The image on the following page is from a drone video clip from we developed for this project that shows the 1 percent chance floodplain on the project site.

A link to the full video on Olsson's website is also provided below:

https://vimeo.com/158259283
password: branson



The existing levee system is not certified by the USACE and does not meet Federal Emergency Management Agency (FEMA) CFR 65.10 criteria for accreditation as a levee. Potential for the existing levee system to be improved to this standard will be evaluated for feasibility and priority to the city. The items to be addressed in order to achieve accreditation include freeboard of 3' over the 100-year flood elevation, levee closure designs, embankment protection, embankment and foundation stability, settlement, and interior drainage.

When evaluating the appropriate level of protection, it will be important to consider potential future increases in the regulated flood elevations. Base flood elevations adopted by FEMA in 2006 were approximately 5 feet higher than those previously adopted in 1995 at the site. Although there is no information currently available indicating an impending increase, it is conceivable that flood elevations will again increase in a subsequent floodplain remapping during the design life of the WWTP. Contingencies to allow for potential future flood protection improvements should be considered where practical. These contingencies can be included in budgeting and design by small incremental increases in strength and base width of levees or flood walls that allow for future increases in height.

Future changes to the flood elevation are largely influenced by the operation of Table Rock Dam which is managed by the USACE. Olsson staff members have a deep understanding of the processes, procedures and protocols of the USACE. Experience with USACE includes both corporate Olsson assignments as well as personal experience and personal relationships of key Olsson staff members. Accordingly, Olsson is positioned to have knowledge of, and access to, relevant studies, programs, and personnel within the USACE - Little Rock District, as they relate to reservoir storage and release operations impacting Table Rock Dam and the White River Basin. Coordination with the USACE will occur early in the evaluation process to determine any differences between programmed release of flows at the dam and flows used by FEMA to calculate 100-year floodplain limits, as well as an assessment of shortcomings in the existing operations protocol and potential modifications to the operations protocol for releases in the future.

For each level of protection evaluated, it will be necessary to investigate the impact of an increased flood elevation *outside* the protected area on the operations *inside* of the protected area. Elements to be reviewed include groundwater seepage pressures, potential flotation of existing improvements, groundwater check valves and the effluent pumping station. The effluent pumps and post-aeration structure were modified in 2009 to provide additional pumping capacity and raised elevation of storage in the structure. The design of this system will be reviewed to determine whether additional modifications are recommended to ensure these systems continue to operate as intended. If it is determined that the system will experience backflow issues, we will consider additional structure modifications along with an option to bypass the post-aeration structure with a secondary pipe discharge directly from the effluent pump to the Lake.

In addition to *level* of protection, the *scope* of that protection will need to be evaluated to determine whether all adjacent city facilities can feasibly be protected or if protection should only be provided for a smaller selection of elements critical to operation of the treatment plant. The existing levee system wraps around the treatment plant facility on the north and extends south along Lake Taneycomo with additional protection surrounding the public works shops. Cost estimates will be prepared for comparison of various extents of protection, and discussion regarding budget will determine the appropriate scope in the recommended solution. It may prove to be more cost effective to relocate non-essential facilities to an area outside of the flooding limits rather than protecting them in place. It is understood that the implementation of any recommended permanent improvements may need to be phased. A combination of both permanent

and temporary solutions may ultimately be the most beneficial to the city. We will continually focus our efforts on creative and innovative solutions that meet the desired goals and fall within the available budget as defined by the city during the early stages of the evaluation. Olsson will provide data driven analysis regarding protection levels, costs, and operational and site impacts to inform the decisions by the city.

We are aware of the urgency of this project which is why we will concentrate our initial efforts on identifying measures that may be implemented quickly to provide immediate benefit. An initial emergency plan, incorporating the use of sand bags or water-filled coffer dams, may be part of the recommended response plan to protect the plant during the development of more permanent design plans and the completion of construction. These first elements may continue to contribute to the longer-term solution as well.

The first step in identifying more permanent solutions and specific methods to achieve the desired level of flood protection will be to perform a skeleton topographic field survey of the area to confirm the level of existing protection relative to flooding elevations. Concurrent with this step, additional geotechnical information will be collected to provide an analysis of the existing soils along the existing and potential levee areas for both stability and transmissibility.

Following the collection and analysis of field data, alternatives will be evaluated for raising the existing levee system utilizing earth fill along with alternatives incorporating a structural flood wall around the area to be protected. The geotechnical analysis will define the stability and suitability of the existing soils, along with any rehabilitation measures that may be necessary to provide an effective earth barrier. Site limitations, including the close proximity of current structures and the lack of space available to perform grading or soil improvement will impact the feasibility of a raised earth berm, especially in the area adjacent to Lake Taneycomo. Transition of grades to maintain access to existing facilities will be considered and will be more difficult to achieve as the existing roadway must maintain grades that are reasonable for use on a daily basis by multiple vehicles. As an alternative, construction of a free standing flood wall will be evaluated particularly in the areas where modified grading is not feasible. Flood-proofing strategies will also be evaluated for some or all of the facilities to be protected. Due to the various constraints on the site, it is possible that the final recommendations will include implementation of multiple flood protection strategies throughout the site. The proposed recommendation will include analysis of costs, land requirements, protection level, and long-term maintenance to determine the most appropriate solution for the city.

Vehicular access will need to be maintained to the plant independent of any flood protection solution implemented. The majority of Compton Drive between the flood protected area and the south edge of the floodplain will need to be raised and rebuilt. Drainage below the modified roadway will be evaluated to ensure continued drainage of the upstream area.

Potential raised roadway and levee improvements will be entirely located within the mapped floodplain and the associated construction will require a floodplain development permit. Improvements will be evaluated for impact to the base flood elevations and adjacent Waters of the United States. Where possible, improvements will be identified to minimize or eliminate extensive environmental or other permitting. The impact to adjacent properties due to the proposed improvements will be evaluated utilizing the current effective FEMA model as a baseline and modifying the model geometry to reflect proposed improvements. Minimizing or eliminating impact on the base flood elevations, wetlands and streams, and adjacent property owners will be included in the evaluation of improvement alternatives.

SUBSURFACE FLOW – GEOTECHNICAL APPROACH (RFP ITEMS 6, 10-11)

We will review the performance records of the seepage control measures that are currently being used at the plant. Our review of the existing plans indicate that at least three 36 inch diameter fully penetrating relief wells are located on the site. While these wells were situated

around the perimeter of the site as it was originally planned in 1984, these three wells are now centrally located on the site, potentially reducing the efficiency of the wells. Clogging of the filter pack around the wells could also have occurred over time, further reducing the effectiveness of this system.

Using existing soils information, we will develop a preliminary subsurface profile of the existing underlying soils at the site. Our initial review of the available existing information indicates that the soil profile consists of clayey and silty soils interspersed with sand and occasional gravel. Bedrock is anticipated to be about 40 feet below the ground surface.

To supplement this existing information, we will advance additional soil borings down to bedrock strata. These additional borings will enable us to obtain samples of the subsurface soils for laboratory testing, including measuring permeability and dispersive characteristics of the subsurface soils. Once the design flood elevation has been established, we will develop a model of the groundwater flow beneath the flood control system to estimate seepage quantities and probable seepage paths. We will refine the computer model using observations from historic floods. The analysis will be performed in general accordance with USACE guidelines for levees and flood walls.

To control seepage, several alternatives will be considered, including, but not limited to, sheet pile walls, diaphragm (slurry) walls, seepage berms, relief wells and toe trenches. Sheet pile walls and diaphragm walls are seepage barriers, while seepage berms, relief wells and toe trenches are methods used to control and collect seepage water.

Sheet pile walls and diaphragm walls would partially to fully penetrate down to bedrock to lengthen or cut off potential seepage paths through and beneath the levee. Sheet pile walls, while routinely used in flood control projects, are typically vibrated in place. This vibration can impact nearby structures. In addition, buried utilities, cobbles and/or other obstructions can limit the installation depths and locations of sheet piles. The feasibility of utility relocation or penetrations through the sheet piles using localized open cut methods will be investigated to ensure a robust evaluation of sheet pile walls.

Diaphragm, or slurry, walls are similar to sheet pile walls in that they form a barrier to restrict groundwater flow. They are constructed by excavating a narrow trench in the ground. A cement bentonite slurry or a bentonite slurry is used to maintain an open trench during excavation. The cement bentonite hardens over time, forming the wall. Alternatively, if a bentonite slurry is used, the bentonite is mixed with soil, forming a low permeable barrier. While slurry walls can be excavated through cobbles and denser material, the presence of underground utility lines can present challenges for the installation of slurry walls.

While sheet pile and slurry walls attempt to cut off seepage, seepage berms, relief wells and toe trenches are methods to collect and control seepage that passes beneath a levee system. Earthen berms constructed on the land side of levees and are used to lengthen seepage paths and prevent piping and sand boils from forming at the toe of levees. Earthen berms do require additional space and will be of limited use on this project. Toe trenches are seepage collection trenches located at the toe of a levee. These fabric wrapped trenches are filled with gravel with a pipe to facilitate drainage to a suitable collection sump. Relief wells are also sometimes used to reduce the hydraulic grade line and control seepage. Relief wells can clog and do require routine maintenance to function properly. Based on the results of our analyses, we will discuss the advantages and disadvantages of each of these options with the city, including initial costs, maintenance requirements, and performance expectations and limitations. We will also provide our opinions on the preferred option to limit seepage beneath the levee for both a short term solution as well as a long term solution once the flood control has been installed.

VALUE ENGINEERING

The flood protection study will identify multiple design alternatives to achieve various levels and extents of flood protection. Cost estimates will be prepared for the options evaluated to provide a basis of economic comparison between the alternatives. During development of final recommendations, we will discuss any budgetary constraints and will work to identify the best combination of solutions to provide the most value in providing flood damage and underseepage protection that best fits the goals and resources available to the city.

FUNDING SOURCES/ASSISTANCE (RFP ITEM 12)

Olsson Associates has helped communities and clients secure and administer grants and other funding sources for a variety of projects. We have been involved at all the different stages, including researching and identifying funding sources, coordinating the process, writing the application, guiding the process through governmental regulations, and serving as a liaison between the funding agency and the client.

Olsson Associates has always been committed to assisting our clients in any aspect of a project to increase its success. This includes assistance in all aspects of the funding process. More and more, the need for outside funding sources is critical to the success of a project and this is why we continue to support and develop our funding and regulatory services. Olsson has experience in all areas of funding, including identifying available sources, preparing applications, understanding the regulations, administering funds, and reporting responsibilities.

Additional Information

CONSTRUCTION CONSIDERATIONS

The success of this study effort will ultimately be dependent on the construction feasibility of the recommendations. To that end, Olsson has added Tom Boyce, of Boyce Excavating, as a constructibility advisor and quality assurance reviewer. Tom has more than 40 years of construction experience in southwest Missouri on complex projects like this one.

As we look forward to the final design and construction of the ultimate recommended improvements, we would introduce for consideration an alternative project delivery method we have completed with other public clients, namely the Urban Drainage and Flood Control District in Denver, CO. The process, called "Project Partners", falls in between traditional design-bid-build and contractor led design-build and was developed to help eliminate the surprises that come with non-traditional or complex design-bid-build projects. This is accomplished by having a selected contractor be actively engaged and vested in the design process, while still keeping control over the selection of the engineer through a QBS process. The program sequence follows these steps:

1. Approved engineer selected for design.
2. Engineer develops plans to 35 percent completion stage and the city issues a condensed Request for Proposals and Qualifications from contractors. The RFP/Q package requests bids on only a few (usually around 10) bid items that are key to the project. The contractor also provides relevant experience, schedule and quality assurance plans.
3. Construction Manager / General Contractor (CMGC) is selected from RFP/Q package, weighted both on unit prices and qualifications, then works with engineer to complete design as a subconsultant to the Engineer.
4. The Contractor and Engineer work together to develop the cost-effective project design and the Contractor submits a guaranteed maximum price (GMP) at final plan stage. The GMP is based upon the unit prices submitted at the 35 percent design bid stage. If reasonable price cannot be achieved, owner and engineer then go to 2nd and 3rd ranked Contractors from 35 percent bid to negotiate as needed.
5. Once city/owner agrees on GMP, the Contractor enters a standard construction contract with the city/owner and the Engineer remains as the owner's representative through construction.

The main benefit to this method is that the tricky construction issues are worked through fully in design and the chance of surprise change orders during construction is reduced substantially.

Quality Assurance/Quality Control

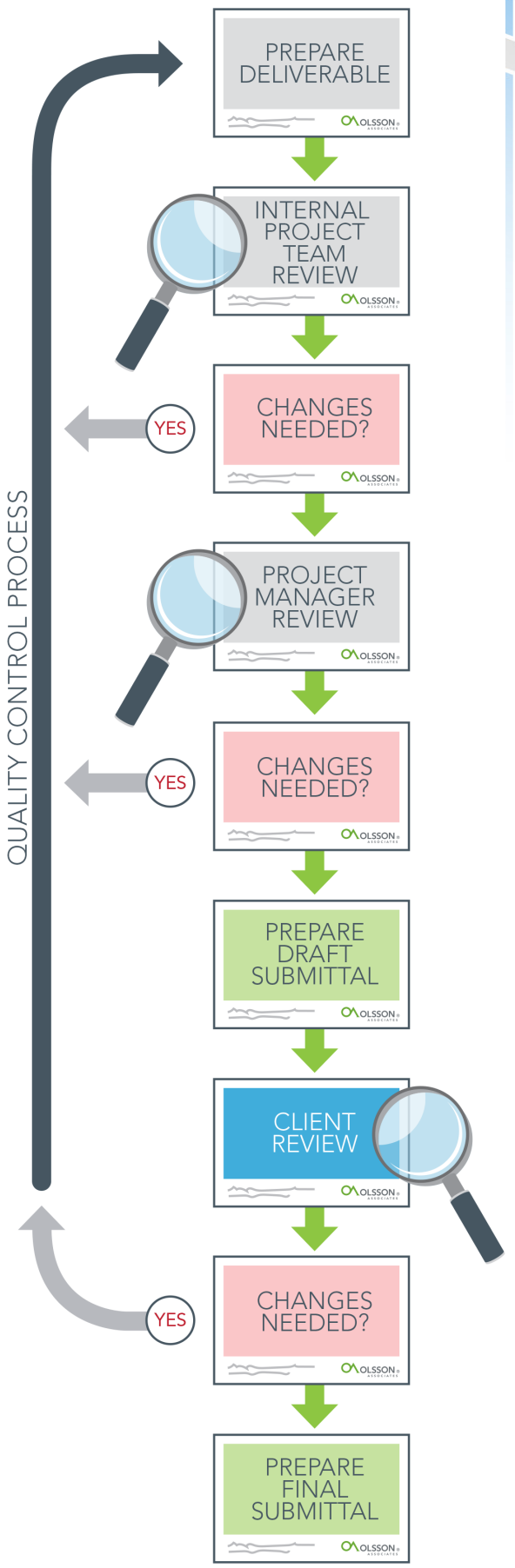
As a service organization, our successful client service is a direct function of our ability to develop and follow a well-defined quality control and assurance program. The Quality Control Plan (QCP) establishes procedures and responsibilities for all team members. Implementation of this plan will:

- Determine the most cost-effective solution;
- Keep the project on schedule;
- Provide complete, high-quality study documents in accordance with city standards;
- Assure that all calculations, cost estimates, and documents are independently reviewed, checked, and back-checked, in accordance with good design practice;
- Ensure that the engineering study clearly and effectively addresses all areas of concern identified by the city; and
- Save the client time, reviewing documents.

At key milestones during the project development, Olsson will conduct in-house technical reviews of the project. The technical review will evaluate and verify the overall design concepts discussed in the study. At a minimum, the review should assure:

- That the design process is adequate to achieve the stated goals;
- That the viable alternatives have been evaluated;
- The practicality and constructibility of the selected design;
- That all legal and physical restraints have been considered; and
- That the design theory, concepts, and project layout are logical.

Tony, the QA/QC manager and Nathan, the project manager, will be responsible for the QCP. They will coordinate and audit quality control procedures for work produced by both Olsson Associates and any sub-consultants and will be responsible for seeing that independent checks are made for all work products. Weekly project meetings will be held with key staff members to review project development as an important part of the QCP. Continuing attention by all levels of management will assure that a QCP is not only clearly identified, but that it is faithfully followed. In addition, they will be responsible for organizing and conducting a peer review of concepts developed during the early stages of the project to ensure optimization of design.



REITZ & JENS, INC.
CONSULTING ENGINEERS

1055 Corporate Square Dr.
St. Louis, MO 63132
p. 314.993.4132
preitz@reitzjens.com

Subconsultants

Crawford, Murphy & Tilly
Gateway Tower
One Memorial Drive,
Suite 500
St. Louis, MO 63102
314.436.0723

Palmerton & Parrish, Inc.
4168 W. Kearney
Springfield, MO 65803
p. 417.624.6000

TABLE OF CONTENTS

Resilience | noun | re•sil•ience
an ability to recover from or adjust easily to misfortune or change

March 11, 2016

Mr. David Miller, PE - City Engineer
City of Branson, Missouri | 110 West Maddux St., Suite 310 | Branson, Missouri 65616

Re: **Request for Proposals | Engineering Study for the Compton Drive Wastewater Treatment Plant Flood Protection Improvements**

Dear Mr. Miller:

Since the early 1960s, Reitz & Jens, Inc. has specialized in two things: geotechnical and water resources engineering with an emphasis on the design and safety of dams and levees. That 50+ years of experience has made us one of the premier consulting firms for levee and flood protection projects in Missouri. Crawford, Murphy & Tilly, Inc. (CMT) has been working with wastewater treatment plants since their founding in 1946 and is recognized as one of the top Midwestern firms for plant work.

For the last several years, we've worked together on a WWTP flood protection project that shares many similarities to the work required at the Compton Drive facility. We believe that our combined experience is unmatched in the area, and our local focus and longevity in the business of consulting engineering make us an ideal choice to bring both quality and value to the City of Branson with this project.

All of Reitz & Jens' staff is based out of our St. Louis office, and several key personnel from CMT are in St. Louis as well, making it the logical choice for the base of operations on this project. If our team is selected, current workloads show that we could begin Data Collection this summer, perform our investigation and have a draft report by October, and submit a Final Report with our findings and recommendations in the last quarter of this year.

While there are other consultants in Missouri that can help the City with general civil engineering services, the Compton Drive WWTP Flood Protection requires the exact type of specialized services we have provided for other clients in the state and throughout the Midwest. Let us help you with this one.

Very truly yours,

Reitz & Jen's, Inc.

Paul H. Reitz, PE, CFM

Principal

REITZ & JENS, INC.
CONSULTING ENGINEERS

CMT

PPI
PALMERTON & PARRISH, INC.

"All study reports were well organized and written, addressing all scope issues. Project team is well versed and knowledgeable..."

Bob Boly,
MSD

"Very organized. Completed on schedule." "No real deficiencies or weaknesses." "Excellent provider. Understood and addressed all aspects of the project."

Gregg Humphrey, P.E., PLS,
Executive Director/Engineer

RESILIENCE

Through Risk Management

Reitz & Jens, Inc. (RJ) is based in St. Louis and maintains a staff of 20 highly technical professionals. The majority of our staff are registered professional geotechnical and water resource engineers who are focused on providing high quality, responsive geotechnical and water resources services. The Metropolitan St. Louis Sanitary District (MSD) has relied on our expertise since the early 1960's, and we have been involved in well over 100 projects with them over this period. We have worked with and been retained by the St. Louis District of the US Army Corps of Engineers for four 5-year multi-year IDIQ geotechnical services contracts since the Mississippi River flood of 1993 and have been unconditionally recommended for future contracts with the Corps of Engineers. The Tulsa District Corps has retained us five consecutive times since 2000 under multi-year IDIQ contracts to evaluate the performance and safety of dams and levees throughout their District boundaries. Our current contract with the Tulsa District expires in 2019.

Risk Management
noun | risk man•age•ment
the forecasting and evaluation of financial risks together with the identification of procedures to avoid or minimize their impact.

Crawford Murphy, and Tilly's (CMT) experience with Waste Water Treatment Plant flood protection goes back over 30 years to the system of relief wells and pumping stations designed to protect the $80M WWTP for the Sanitary District of Decatur, IL. The Springfield Metro Sanitary District relied on CMT to design and permit their new Spring Creek WWTP, largely within a regulatory floodplain. CMT helped them quickly reduce their flood insurance premiums for the new facility by obtaining Letters of Map Revision Based Upon Fill (LOMR-F) from FEMA within 4 months after completion of the structures in 2012. In order to remove the entire facility from the floodplain, CMT modeled over 4 miles of waterway to demonstrate the project had no adverse impact on water surface elevations and received a final determination and approval in May of 2015.

Palmerton & Parrish, Inc. (PPI) is a Consulting Engineering Firm that specializes in Geotechnical Engineering, Subsurface Drilling, Construction Materials Testing, and Environmental Services. PPI provides quality, well-rounded services to their Clients with a responsive professional staff; well-trained drilling, field technician, and laboratory technician staff; and an extensive array of construction materials testing and subsurface drilling equipment.

The structure of our team is outlined (right). The core of this team is the same staff that was instrumental in the study and recommendations for improvements to protect the Greater Peoria Sanitary District's WWTP along the Illinois River. That effort focused on meeting the post-Katrina Federal requirements for Levee Certification, which may or may not be possible at the Compton Drive facility, but all of the same project features and alternatives need to be considered.

What is the facilities ability to handle internal drainage during a severe event?

What pipes and conduits are buried and are they an asset in flood fighting, or a liability?

What are the subsurface conditions of the facilities and how does rising and falling water levels impact them?

What impact do the recommended improvements have on the regulatory floodway and floodplain, and your neighbors near the plant?

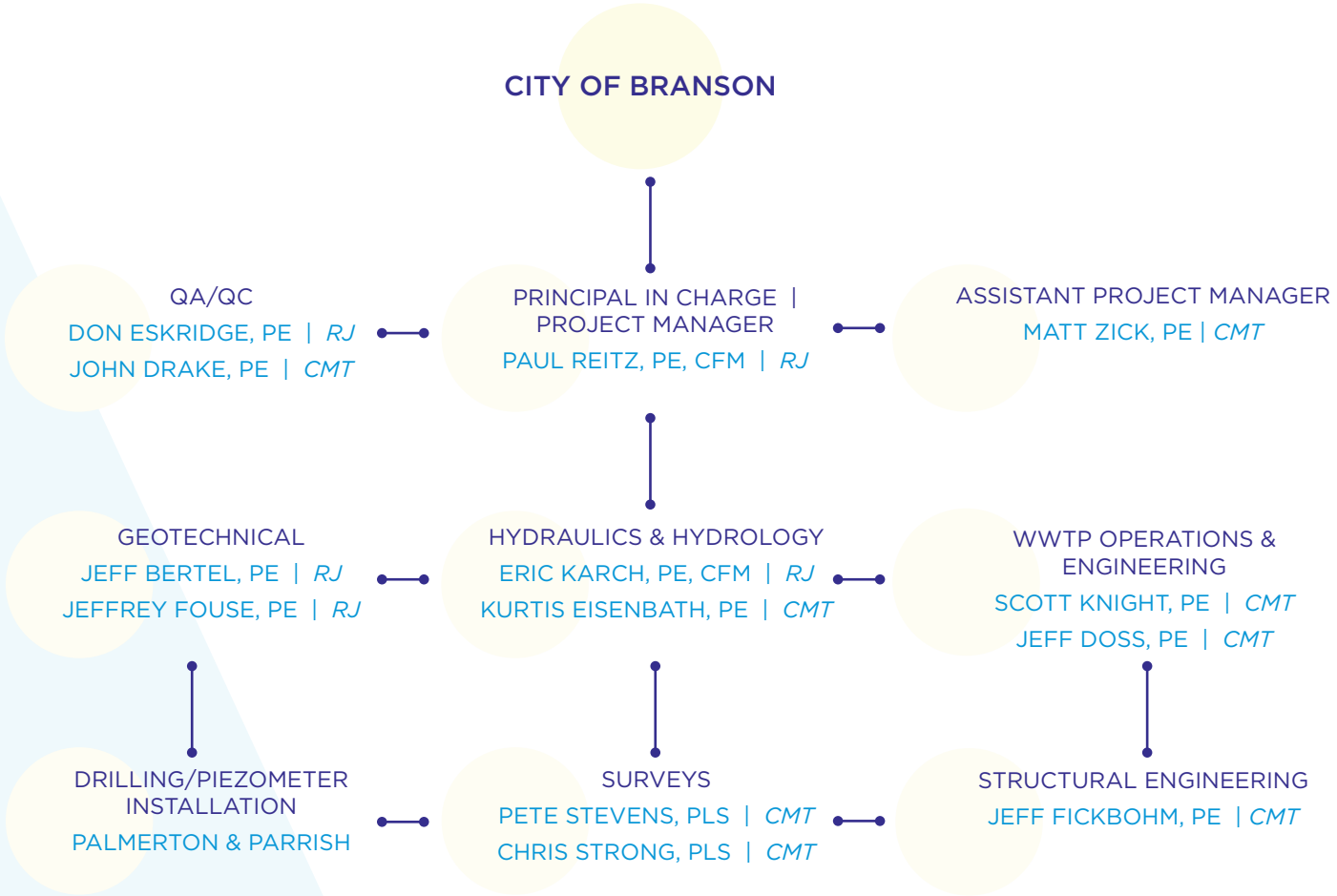
What buildings and facilities need improvements or protection to secure the maximum level of protection at the most reasonable cost?

How can we quickly and effectively put a flood fighting plan in place to help ensure the safety of our employees and the operation of our equipment?

How high can or should the embankment/floodwall be and what can be done to provide interim protection until more permanent measures are in place?

ORGANIZATIONAL CHART

Compton Drive WWTP Flood Protection Improvements



Approach

An effort of this type begins with a couple of basic steps, mostly centered on collecting data, but also establishing and defining the Quality Control/Quality Assurance process. Our team will be led by Paul Reitz and Matt Zick, a pair of seasoned professionals who have spent their entire careers working in this industry. Their involvement at key points throughout the process will be committed to making sure the right questions are asked, the data is understood, and the solutions make sense. Our team of engineers have over 200 years of geotechnical and water resources engineering and WWTP design and operation experience. Another immediate objective is to meet and talk with City staff. We want to understand the City's priorities and budget considerations. We are interested in staffing levels and capabilities, and emergency and operations plans that may already be in place. Interim flood protection measures that rely on large amounts of equipment and manpower may not be appropriate, so we need to understand and tailor our approach.

Quality has and will always remain the primary focus at Reitz & Jens, Inc. We have remained small, in part to maintain tight control on the quality of our services. The size of our firm assures that there is continuous interaction between all firm members to create a collaborative approach to solving problems throughout the design process. Through close communication with all internal personnel and the City of Branson, we will maintain control throughout evaluation and design of flood protection alternatives for the Compton WWTP. Reitz & Jens, and Paul Reitz in particular, will have primary responsibility for the quality of the completed work.

VALUE ENGINEERING

Our team is experienced in utilizing VE principles in both the concept and detailed design phases of a project by convening formal VE workshops and also more informal applications. The VE process during the study phase would typically include the following steps.

1 The purpose and need of the study is explored with the City of Branson to fully understand the function(s) of improvements and its applicable performance criteria. Though the primary function of the project might be to protect the plant, secondary functions such as protecting support facilities and reducing or mitigating impacts on adjacent, upstream and downstream properties would also be desired. Flood risk levels, associated costs and owner risk-tolerance levels would be identified.

2 The purpose and need are defined in terms of functions, which are two-word descriptors using an active verb and measurable noun. Such project functions might include: maintain service; protect plant; prevent overtopping; restrict seepage; reduce impacts, etc. Such analysis provides an informed basis for developing creative alternatives to perform these functions.

3 Creative ideas are generated through brainstorming to develop a large list of alternatives that perform the desired functions. In generating creative ideas, questions are asked such as "What other ideas would perform the function?" "Is this function needed?" "Is this function needed in this amount?"

4 The alternative ideas are screened and evaluated for their ability to perform the functions in terms of performance and approximate cost.

5 The best-performing ideas are selected for further development into specific design-concept alternatives, including detailed descriptions, sketches/drawings, estimated initial and life-cycle costs and associated risk levels.

6 The developed alternatives are presented to the City of Branson for review, acceptance, modification, further refinement and/or rejection.

7 Following incorporation of Branson's review comments and disposition of alternatives, the output of the study would be incorporated into a brief report, which would include such elements as the accepted/refined alternatives descriptions, cost estimates, risk levels, benefit/cost ratios and/or performance/cost ratios in table form for ease of owner review. The benefit/cost information would include potential grant funding from other sources so that benefit/cost-to-owner ratios would also be presented.

These steps can be performed by the design team, or in a workshop setting using internal team subject matter experts (SMEs), or a workshop setting using external subject matters SMEs (often used in a formal value engineering study).

Following the study process, the preferred alternative(s) would be further refined using the same value engineering procedures, but with more detailed engineering studies and cost estimates.

Should the team be selected, the appropriate level of VE-procedure formality and level of effort will be discussed with the City and incorporated into of the scope of services for the project.

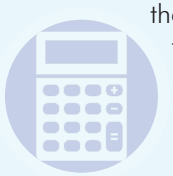
Construction plans and any studies that have been done through the years for the City of Branson will need to be gathered and reviewed, and LiDAR or other publically available mapping can keep survey crew time focused on the City's facilities. Corps and FEMA documents will be critical to setting the parameters of this effort. How much water, how often, how quickly, how long? The White River Water Control Plan and FEMA's effective modeling and mapping will tell us a lot about the external forces and regulatory agencies that we have to contend with. The work we do gathering data and understanding operations and capabilities will provide the internal knowledge needed to develop a plan that balances the forces, internal and external. Early emphasis will be placed on developing interim/temporary protection options & recommendations.

PROJECTS WITH SPECIFIC COMPLETION SCHEDULES OR DEADLINES ARE GIVEN PRIORITY AT REITZ & JENS.

MEET SCHEDULES - Our team routinely demonstrates its ability to not only meet schedules, but also perform on accelerated schedules to meet specific client needs. To complete these projects on time and within budget, we will implement the same managerial approach we have successfully implemented on our other studies and design projects. This will result in quality results which are constructible given the constraints of each project scope. Our approach is designed to provide the high quality results the City of Branson expects, while limiting the time and expense the City will need to expend managing the process. The entire project team has been trained to work in close collaboration with our clients to maintain an open dialogue during evaluation, design, document preparation, and construction. This allows the team to identify, discuss, and resolve potential issues before they impact the project schedule, quality, design fee or construction cost.

"All review submittals were on time or early. The submittals were complete with previous comments addressed."

Allen Mueller, MSD



STAY WITHIN BUDGET - While it is not uncommon for amendments to be required as the result of client-driven actions that modify the scope of a project, amendments do not occur as the result of our team's project management. We work with the client throughout the projects duration to incorporate their requests for revisions to the scope. Ideally, we can accommodate client requests for changes within our original contract fee during the production phase. Additions to the project scope of major work items will generally be compensated by supplemented negotiations with the owner. A scope that is clearly defined at the onset will typically reduce the necessity for contract amendments.

"Great firm to work with and they deliver on time and on budget.

Brad Temme, Project Manager, City of St. Charles, MO

Investigations & Draft Report

The wet wells already installed at the plant will be a very useful tool as the study moves into the next phase, the detailed investigations. We propose to use Palmerton & Parish to install piezometers near the wet wells, which would provide new soils information during the installation and the ability to measure groundwater levels after their completion. Flow testing on the wet wells and monitoring the effect in the piezometers will provide critical information about the transmissivity of water in the soil and area of influence of the wells, that could be valuable during the seepage and stability analysis and could help shape the protection alternatives that we put forward.

At the same time, we'll be diving deeper into the facilities and function of the treatment plant and surrounding buildings. Coordinating with City staff and inventorying mechanical and electrical facilities to establish what gets impacted, when, and what we can do about it. Reviewing FEMA's effective model will help determine if corrections are needed to more accurately reflect the area. When combined with the subsurface information, the team will collaborate to develop alternatives for protection from an aboveground and below ground perspective, and then review those against the interim recommendations to see if one can make the other more effective. Client coordination at this point will help us vet our ideas and refine some of them, while possibly eliminating others before unnecessary time is spent on them. These ideas can then be translated into a proposed conditions HEC-RAS model to see the effects on the facility and the surrounding areas before developing a preliminary Opinion of Probable Cost (OPC).

Final Report and Recommendations

Once we put some costs together with our ideas and have an understanding of what level of protection they provide and the impact on surrounding areas, we'd recommend another workshop with the City to review all of the data and findings. Our conclusions and recommendations need to be based on what works for the City and your staff. This ongoing communication and collaboration process is part of both the QA/QC process, and the economics alternatives analysis (value engineering). The final report will also be a roadmap for the next phases of the project, laying out what's needed to accomplish the recommendations, the permitting and approval process, and the potential timeline.

Paul Reitz, PE, CFM

Principal in Charge | Project Manager

Paul has over 30 years of experience in the consulting engineering and general contracting industries and significant expertise in the management of dam and levee inspections, geotechnical and hydrological investigations, water resources design projects, wetland studies, and geotechnical instrumentation programs. Paul has been Reitz & Jens' Program Manager on all five IDIQ Dam Safety Contracts with the Tulsa District since 2000, and our current Tulsa IDIQ Geotechnical Services contract. Paul has also been manager of several task orders completed under this contract. He has also been Program Manager during all four Miscellaneous Geotechnical Services Contracts for the St. Louis District since 1993. Paul's responsibilities on this project will be to coordinate and manage all technical, financial, legal, and scheduling aspects of the contract.

Education
MBA, Washington University, St. Louis, Missouri, 1990
BSME, University of Michigan, Ann Arbor, 1981
Projects
GPSD Levee Investigation & CLOMR Documentation, USACE Tulsa & St. Louis Levee periodic inspections, USACE St. Louis Alton-Gale Levee, Ameren Sioux & Labadie Landfills, Columbia Bottom Conservation Area

Don Eskridge, PE

QA/QC

Don has almost 50 years of experience providing field reconnaissance and evaluation of soil conditions, hydrogeological investigations, seepage investigations, urban drainage and erosion control analysis and design, relief well dewatering, slope stability analysis, deep and shallow foundation design and recommendations, and evaluation of geotechnical data for the safety assessment of dams, levees, and local flood protection projects. He has provided geotechnical services for evaluation and construction of dozens of levees, dams, and urban drainage projects. He is an ASCE Fellow and an affiliate member of the Association of State Dam Safety Officials (ASDSO).

Education
BSCE, Washington University, 1965
MSCE, Soil Mechanics, University of Illinois, 1966
Projects
GPSD Levee Investigation & CLOMR Documentation , USACE St. Louis Alton-Gale Levee, USACE Tulsa Levee periodic inspections, Ameren ash pond stability analysis, Earth City Levee System, Lake Boutin dam stabilization, Columbia Bottom Conservation Area

Jeff Bertel, PE

Geotechnical Lead

Jeff has led the inspection, field investigations, studies and design of a broad range of geotechnical projects including dams, levees, landfills, stream stabilizations, retaining walls and structures. He has provided both field investigations and analysis of many dam and levee task orders for the Tulsa District. Prior to working at Reitz & Jens, Jeff gained valuable experience working on the design and construction of a variety of civil projects which included water and wastewater infrastructure, roads and commercial buildings. His academic training includes significant experience in both intrusive and non-intrusive, and non-destructive shear-wave velocity testing. Mr. Bertel has a strong understanding of the practical usage of many different geotechnical modeling programs which include Slide, Slope-W, WinSASW, GRLWEAP, LPILE, SHAKE and Plaxis.

Education
MSCE, Geotechnical Engineering, University of Missouri-Columbia, 2006
BSCE, University of Missouri-Columbia, 2004
BS Geology, University of Missouri-Columbia, 2000
Projects
GPSD Levee Investigation & CLOMR Documentation , USACE Tulsa & St. Louis Levee periodic inspections. Ameren ash pond stability analysis, Sioux & Labadie Landfills, Earth City Levee System, Lake Boutin dam stabilization

Eric Karch, PE, CFM

Hydraulics & Hydrology

Eric has 16 years of engineering design and project management experience on a wide variety of projects, including: hydrologic and hydraulic modeling, stormwater management, and the design of stormwater systems, culverts, and roadways. His environmental project experience includes watershed management plans, stream restoration, and fish passage structures. Many of these projects involved preparation of plans and specifications, acquisition of permits, and management of construction. Design and evaluation techniques included the use of ArcGIS, AutoCAD, TR-55, HEC-1, HEC-2, HEC-HMS, HEC-RAS, HY-8, XP-SWMM and Pond Pack computer programs.

Education
MSCE, Hydrosystems, Virginia Tech, Blacksburg, VA 1999
BSCE, Environmental Engineering, Virginia Tech, Blacksburg, VA 1997
Projects
USACE Tulsa Levee periodic inspections, MSD general and Sappington Creek, Ameren ash pond stability analysis

Jeffrey Fouse, PE

Geotechnical Engineering

Jeff has move than 30 years of engineering design and project management experience on a wide variety of projects, including: landfills, dams and levees, buildings, parking structures, large tanks, industrial facilities, bridges, pavements, airports, parks, cofferdams, excavation shoring, dewatering and seepage control systems, electric substation and transmission lines, and river structures. Many of these projects involved preparation of plans and specifications, and management of construction quality control services. He has also worked on environmental projects and projects requiring management of both geotechnical and environmental tasks.

Education
MSCE, Geotechnical Engineering, University of Texas, 1984
BSCE, Ohio State University, 1975
Projects
USACE Tulsa Levee periodic inspections. Ameren ash pond stability analysis, Sioux & Labadie Landfills, MSD general and Sappington Creek

Matt Zick, PE

Assistant Project Manager

Matt has 20 years of professional experience in drainage, sewer systems, water distribution, transportation, and land development. Matt led the original investigation into levee certification for the Greater Peoria Sanitary District in 2008 and served as the Project Manager in the multi-year preparation of the documentation, modeling, alternatives analysis, and conceptual design of the improvements that would be required to pursue levee certification. That effort resulted in the issuance of a Conditional Letter of Map Revision from FEMA in 2015, which gave the District a defined pathway to the post-Katrina standard of Federal levee accreditation and the resiliency to maintain operation of the plant under extreme conditions. Matt continues to work closely with Reitz & Jens on WWTP flood protection projects.

Education
Bradley University, BSCE, 1996
Projects
GPSD Levee Improvement Design, GPSD Levee Investigation & CLOMR Documentation & GPSD Levee Certification Assessment Report

John Drake, PE

QA/QC

John is Manager of CMT's Springfield Wastewater Group. Over his 39-year career, he has consulted with numerous wastewater Clients to address their wastewater collection and treatment needs. In addition to his years of comprehensive planning and design accomplishments, he is actively involved with the Illinois Water Environment Associations and the Illinois Associated of Wastewater Agencies. He offers clients an experienced perspective on the regulatory landscape, both existing and trending, that are affecting local decisions regarding wastewater management and facility design. Mr. Drake's approach is to work with clients, agencies and other stakeholders to arrive at designs that balance environmental and economic goals.

Education
Ball State University, B.S., Math and Physics, 1974
Purdue University, BSCE, 1976
Projects
SMSD Spring Creek WWTP LOMR
Sanitary District of Decatur, Illinois

Scott Knight, PE

WWTP Operations & Engineering

Scott is currently a project manager/design engineer, primarily working on wastewater collection and treatment projects. Specific tasks include scope development and manhour estimating; contract preparation and negotiation; coordination between engineering disciplines; schematic and detailed design; preparation of project drawings, specifications and contract documents; preparation of opinions of probable construction cost; permitting; bidding phase assistance; financing assistance; construction observation; and start-up assistance. Past projects include evaluation, planning and design of wastewater treatment facilities, sanitary collection systems, sanitary pumping stations, etc., for both municipal and industrial clients.

Education
University of Illinois, BSCE, 1989
Projects
Springfield, Illinois, Metro Sanitary District Northeast Public Sewer District, Fenton, Missouri & Sanitary District of Decatur, Illinois

Jeff Fickbohm, PE

Structural Engineering

Jeff is lead structural engineer for water and wastewater treatment plant projects. He has been involved in designing structures for new and existing wastewater treatment plants and pump stations for the past 27 years. He coordinates the design and preparation of structural drawings, specifications, reports and cost estimates for structural engineering projects.

Education
University of Illinois, BSCE, 1988
Projects
City of Litchfield, Illinois- Litchfield Lake Dam, Walton Lake Dam & Lake Lou Yeager Springfield, Illinois, Metro Sanitary District

Jeff Fickbohm is the newest addition to CMT's Springfield, Missouri, office, having been transferred from the Springfield, Illinois, headquarters.

Kurtis Eisenbath, PE

Hydraulic Engineer

Kurtis Eisenbath has been with CMT since 2001 and has served as a project manager, design engineer and modeler on projects in the water resources business unit. He has provided hydraulic engineering and modeling on various projects ranging from street, airport, and site drainage. He is experienced in the usage and integration of GIS with hydraulic modeling.
Education
University of Missouri-Rolla, BSCE, 2000
University of Missouri-Rolla, MSCE, 2002
Projects
Greene County, Missouri Farm Road 167 over North Dry Sac River, replacement bridge hydraulic analysis, City of Springfield, Missouri Mount Vernon Street replacement culvert hydraulic analysis

Jeff Doss, PE

WWTP Operations & Engineering

Jeff comes to CMT after a decade as Executive Director of a large wastewater utility in Missouri. During this time he was responsible for the day-to-day activities of the business, including personnel management, accounting and budget development, and engineering planning functions. Jeff is well versed in the detailed operations, maintenance and administration of a well-run wastewater utility. He provided ongoing operations training and served in an advisory role for the operations staff responsible for all 13 of the Districts wastewater treatment plants. Together with the operations staff, Jeff managed to reduce energy consumption and biosolids production at the District's primary treatment facility while overseeing a doubling of the population it served.

Prior to Jeff's executive experience, he was a project manager in municipal consulting engineering, focused primarily on the water and wastewater fields. He was involved with the project management and design of wastewater collection system designs, wastewater treatment plant designs, water distribution system analysis and water treatment plant designs.

Jeff is currently focused on bringing his knowledge and experience as a previous utility owner to the clients he services in the water resources industry.

Education
Southern Illinois University-Edwardsville, BSCE, 1993
Projects
Collinsville, IL Biosolids Facility Planning, Portageville, MO WWTP Facility Planning NPSD Saline Creek WTP – Phase 1, Stone County, MO - Box Canyon WWTP – Phases 1 & 2

Warren Knoles, PE, AVS

Value Solutions

Warren is a Senior Vice President and serves as project principal and technical advisor for transportation and land development projects. He has been instrumental in leading innovative VE processes that have achieved significant cost savings through efficient methods. Warren is certified by the Society of American Value Engineers (SAVE) International as an Associate Value Specialist (AVS) and has facilitated a number of highway Value Engineering studies.
Education
Bradley University, BSCE, 1970
Projects
Value Engineering Study for: Indiana Department of Transportation, City of Rockford, Illinois, & Missouri Department of Transportation

Throughout this program Reitz & Jens has worked to develop standard procedures and methods for the inspection, evaluation, and analysis of dams, levees and other water retaining and control structures to assure the quality, consistency, and repeatability of the results. In recognition of our performance, including the quality of work and our ability to complete the work on schedule, all ACASS performance reviews issued by the Tulsa District for these four contracts unconditionally recommend Reitz & Jens for future contracts with the Corps of Engineers.

Dam Safety Evaluation & Inspection

U.S. Army Corps of Engineers, Tulsa District

The Tulsa District of the US Army Corps of Engineers selected Reitz & Jens for five consecutive contracts since 2000 to provide Dam Safety Evaluation and Inspection services within the Southwestern Division (SWD) boundaries. Almost 90 separate task orders have been issued over a 15-year period with all performance reviews unconditionally recommending Reitz & Jens for future contracts with the Corps of Engineers.

Over this time period, Reitz & Jens was asked to:

- Complete annual inspections and evaluations of embankments, spillways, levees, and service bridges at 45 Federal dam, levee, and lock systems
- Cleanout, test, and evaluate relief well systems at 22 Federal Dam and Levee systems and evaluate the performance of piezometers at 33 Federal dam and levee systems within the Tulsa District boundaries.
- Evaluate the Caney Levee system for conformance with National Flood Insurance Program (NFIP) requirements, including Hydraulics and Hydrology modeling, evaluation of subsurface conditions by geotechnical investigations and determination of flood protection level.
- Upgrade Flood Emergency Plans for more than 25 Federal Dams
- Establish and monitor instrumentation systems for seven dikes at Fort Gibson Lake
- Complete Periodic Inspections and Risk Screenings for 15 Federal levee systems in Kansas and Oklahoma. This required comprehensive evaluation of both the geotechnical and hydrological aspects of each system

As part of a separate Geotechnical Services contract, Reitz & Jens was retained to:

- Perform a subsurface investigation along the outlet conduit of the Wister Dam, including boring and sampling of dam embankment to determine the presence and extent of dispersive soils along the conduit.
- Develop an on-site testing laboratory at the Pine Creek Dam, to be certified by the USACE Research and Development Center, Materials Testing Center to conduct all materials testing required during the construction of a flexible concrete cutoff wall, new seepage blanket, steel liner and concrete repair road.
- Install piezometers, relief wells, inclinometers, and recording pressure transducers to supplement or replace existing equipment at eleven dams with the Tulsa District boundaries.

Wade Anderson,
Director-Dam Safety
Production Center
918.669.7654

WWTP Flood Protection and Levee Certification

Greater Peoria Sanitary District

Phase I – Assessment Report

The Greater Peoria Sanitary District has a drainage area of over 65 square miles and serves approximately 140,000 residents of Peoria County with an average daily flow of approximately 24 MGD through their facility along the Illinois River. The District requested an investigation to assess their facilities and determine the effort involved in applying to the Federal Emergency Management Agency (FEMA) for recognition of the levee on the Flood Insurance Rate Maps (FIRM) to remove the plant from the Special Flood Hazard Zone. The effort involved coordination with FEMA and the Corps of Engineers on the potential for changes to the floodway computations used to establish the base flood elevations along the Illinois River; surveys of the existing levee to document its condition and crest profile; and a review of GPSD record documents and the prerequisites for levee certification. In order to get a better understanding of the geology beneath levees, CMT teamed with Goodpaster-Jamison for a review of soil boring data collected by the District through the years as the plant changed and expanded. The result of the investigation was a report that summarized the requirements for certification through FEMA and an analysis of what improvements would be necessary to apply for certification.

Phase II – Detailed Investigation & CLOMR Application

Based on our analysis and recommendations, the Sanitary District decided to proceed with a more detailed study and preliminary engineering to support an application for a Conditional Letter of Map Revision (CLOMR) from FEMA. Given the complex and long-term nature of the work, the District retained CMT and Reitz & Jens to work together on more detailed surveys, a comprehensive subsurface investigation that included ground water elevation monitoring wells, an interior drainage study, levee penetration and closure documentation, embankment stability modeling and embankment protection recommendation and preliminary plans for raising the crest elevation of the levee to meet freeboard requirements. CMT prepared HEC-RAS modeling of the Illinois River for IDNR and FEMA based on the effective HEC data. FEMA issued the team a CLOMR in August of 2015.

"Compared to other consultants, CMT has a superior process for customer feedback."

Stan Browning
Executive Director
Greater Peoria Sanitary District

Stan Browning, Executive Director
309.637.3511

For over 40 years, Reitz & Jens has acted as the Levee District Engineers on an as-needed basis to address any issues which arise within this levee system that protects an office park valued at over $1 billion. These services include an annual inspection of the levee embankment, underseepage protection system, and appurtenant structures with recommendations for maintenance and upgrades.

Earth City Levee System

Earth City Levee District

Starting in 1972 Reitz & Jens, Inc. was engaged to review underseepage analyses, bank stability and erosion control, and a complete hydrologic flood study to determine adequate levee height and pump station capabilities. Reitz & Jens has since been retained by all subsequent owners as Levee District engineers providing periodic review of the levee's conditions and making recommendations for upgrading and maintenance of the levee system.

In 1988, Reitz & Jens designed and provided on-site construction inspection services for a relief well system to further upgrade the levee stability. The 64 relief wells installed increased the development area's flood protection to 500-year flood level occurrence as determined by the U.S. Corps of Engineers.

During the floods of 1986, 1993, 1995 and 2015 Reitz & Jens was retained on an emergency basis to monitor and evaluate the levee system's performance during the flood fight to assure its integrity was maintained. This work included evaluation and treatment of small sand boils and seeps, evaluation of relief well performance, and evaluation and treatment of any other flood related problems that arose in this event.

The Earth City levee system was one of the few private levees along the Missouri River which withstood the Great Flood of 1993 with no significant problems.

In 1995 a new program was developed by Reitz & Jens to annually test a statistical sampling of the relief wells to evaluate their performance compared with design requirements. The first evaluation determined some of the oldest wells had significantly deteriorated, and a program to rehabilitate these wells was immediately implemented. This well rehabilitation program was successfully completed in 1996. In 1996 the Levee District undertook a program to improve interior drainage, which included backfilling an interior blue-hole, installation of new detention basins, rehabilitation of existing lake shorelines, and upgrading the pumps station. Reitz & Jens continued in its capacity as a levee consultant by providing engineering services associated with surface and subsurface hydrology, seepage, levee and slope stability, shoreline and slope erosion, pump station foundations and field quality control services during construction of these improvements.

Underseepage analyses and ongoing relief well pump tests in the early 2000's identified additional areas that required additional underseepage protection, or replacement of underperforming relief wells. The new and replacement relief wells and associated underground piping systems were designed and installed under the inspection of Reitz & Jens later that same year.

Ryan Hodges, President
ECLD Board of Trustees
314.291.8902

Electrical Power Generation Dams and Levees

Ameren Missouri

For more than 10 years, Reitz & Jens has been the primary provider of engineering services to Ameren Missouri for dam safety, levee inspection, stability analysis, and permitting of projects at their coal fired power plants in Eastern Missouri and Western Illinois

Ash Pond Evaluations & Recommendations

Beginning in 2007, Reitz & Jens evaluated the existing Coal Combustion Residual (CCR) containment ponds at Ameren's Meramec, Sioux, Labadie and Rush Island Energy Centers to determine whether they should be classified as regulated dams in the State of Missouri. These Phase I studies included evaluation of each pond's embankment stability and hydrologic capacity, and provided general recommendations for maintaining the ponds as regulated and unregulated dams in Missouri. The results also required detailed analyses and design to upgrade and register a pond at the Rush Island plant as a Class II dam with the Missouri Dam & Reservoir Safety Council. Reitz & Jens is currently completing an analysis of these same ponds for compliance with 40 CFR Part 257 (the CCR Rule) that became effective in April 2015. This includes a comprehensive analysis of all geotechnical, hydrological, stability and operations of the active ponds at each of these plants, most of which are in the 100-year floodplain of major rivers.

Utility Waste Disposal Facilities

Reitz & Jens is the primary designer of the Labadie and Sioux disposal facilities along the Missouri and Mississippi rivers. Both sites were within the 100-year floodplain and required extensive geotechnical evaluation and design including site investigation, underseepage and through seepage, bearing capacity, slope stability, lateral deflection, soil permeability, and foundation recommendations. Levee protection facilities were designed and permitted by R&J at both facilities; Labadie to the 500-yr elevation and Sioux to above the 100-yr level.

Thomas L. Hollenkamp,
Chief of Dam Safety
Engineer & Manager
314.957.3406

Missouri River Fish and Wildlife Mitigation Project Columbia Bottom Conservation Area

U.S. Army Corps of Engineers, Kansas City District

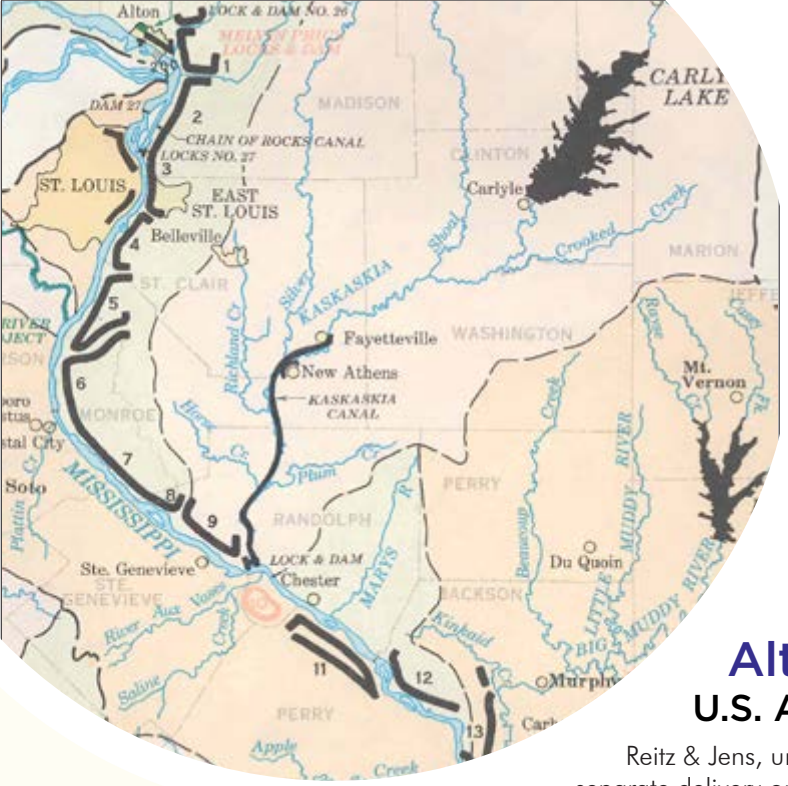
Reitz & Jens prepared the designs, plans, specifications, and construction cost estimates for the creation of over 1,000 acres of wetlands within the Columbia Bottom Conservation Area at the confluence of the Missouri and Mississippi Rivers. The project included design and construction plans for relocating 8,000 lineal feet of levee for the Corps and the design of a new pump station and piping for the managed wetlands. The entire site was within the 100-year floodplain.

The comprehensive scope of services included:

- Alternatives analysis for water supply, pumping stations, control structures, and scour & erosion protection
- Detailed geotechnical investigation
- Hydraulics and Hydrology (H&H) calculations and modeling
- Seepage characterization, underseepage analysis, and foundation design for the levee system
- Interior flood hydrology & design of improvements

The Missouri Department of Conservation awarded Reitz & Jens a separate contract to provide all geotechnical services during design and construction of related infrastructure improvements, including viewing platforms, a fishing pier, over 3 miles of roadway and parking lots.

Donald Meier, Chief-
Infrastructure Branch
816.983.3121



Reitz & Jens' project team received an overall performance evaluation rating of "Excellent" on this contract and was unconditionally recommended for future contracts with the USACE. In addition, the St. Louis District awarded Reitz & Jens a certificate of appreciation, specifically citing the responsiveness of our management staff and professional services rendered in support of the Geotechnical Services required under this contract.

Alton to Gale Levee System

U.S. Army Corps of Engineers, St. Louis District

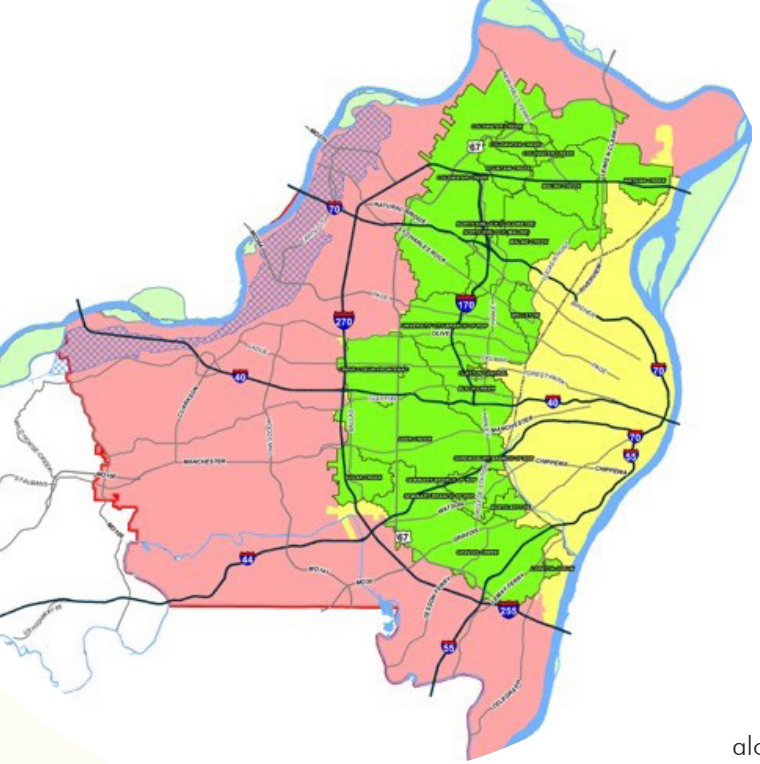
Reitz & Jens, under our Miscellaneous Geotechnical Services Contract with the St. Louis District, was retained under eleven separate delivery orders to provide various testing, evaluation, and design of relief wells on the Alton-to Gale Levee system along the Mississippi River from Alton, Illinois, to Cape Girardeau, Missouri.

- A total of 141 relief wells and 138 piezometers in thirteen different levee districts were cleaned, pump tested, and evaluated under nine separate delivery orders. The relief wells were cleaned out using a combination of air lifting, piston bailers, and a patented hot acid treatment.
- The pump tests were performed with both centrifugal and submersible turbine pumps. All pump tests were recorded using pressure transducers connected to an automatic Hermit 2000 datalogger that simultaneously recorded the flows through a discharge orifice and the drawdown in the pumped well and two adjacent wells. This raw data was used to calculate each well's specific yield and the specific capacity of the aquifer. These results were compared with the theoretical capacities to determine what improvements were needed to each relief well system.
- During a one-week period, personnel were mobilized to measure the flow rates and head in 144 relief wells and 133 piezometers in eight separate levee districts. The measurements were made using paddle type flowmeters and water level indicators. These field results were compared with theoretical results to evaluate the system's performance during an actual flood event.

Two additional delivery orders were issued to analyze several value engineering alternatives for the underseepage relief system on the Sainte Genevieve levee and design a relief well system to address underseepage at the Bois Brule Levee System. These delivery orders required design and installation of a deep well and surrounding piezometers to perform a full-scale aquifer pump test.

The results from these tests were used finalize the underseepage relief system for the northern portion of the Sainte Genevieve Levee, resulting in a significant costs savings.

Troy Cosgrave
314.331.8421



Sewer System Capital Improvement Program

Metropolitan St. Louis Sewer District

Reitz & Jens has enjoyed a long working relationship with the Metropolitan St. Louis Sewer District (MSD) that dates back to the early 1960's. Since 1995, RJ has provided geotechnical services including investigations, laboratory analysis, recommendations and constructability review for over 100 projects either as a prime consultant or as a geotechnical subconsultant.

MSD annually prequalifies Reitz & Jens to provide the following engineering services

- Geotechnical
- Environmental
- Flood Protection
- Stormwater
- Natural Channel Restoration
- Sanitary & Combined Sewer
- Sewer Restoration
- Construction Management

Some of the more challenging recent MSD geotechnical projects include: the Lower Meramec Wastewater Treatment Plant; the Lemay Overflow Relief System Pump Stations and Gate Structures along the River Des Peres; the Arsenal Street Slide repair on the River Des Peres, the Kortwright-Warson Place Storm Relief Sewer along Deer Creek, and the 18-foot diameter, 4 mile long Deer Creek Sanitary tunnel.

These geotechnical projects have all required a thorough understanding and evaluation of subsurface construction methods as well as the long term impacts the subsurface conditions will have on the performance of MSD's improvements. Typical subsurface conditions that were evaluated on these projects include soft soils, shallow groundwater, running sands below groundwater, shallow rock, unstable slopes and adjacent structures/improvements. These projects often required that subsurface investigations be conducted in fully developed areas where access is difficult.

In addition to providing geotechnical services, over the last 20 years MSD has retained RJ as a prime consultant to evaluate and design a wide variety of urban drainage and channel stabilization projects. Some of the more challenging design projects include: the Fishpot Creek Bank Stabilization at Pepperdine Court; the Sappington Creek Meath to Gravois watershed study – a pilot study to develop standards for District wide evaluation of open channel geomorphology, flooding and erosion; the Hallstead Storm Channel Phase IV – to evaluate, design and permit a large channel stabilization project considering both structural and biostabilization alternatives; the River Des Peres Channel Rehabilitation, Phase I Outfalls & Erosion Comprehensive Study – to evaluate and design projects to stabilize the banks of the entire River Des Peres channel; and the Stormwater Facility Engineering contract where as a subconsultant RJ acted as an extension of MSD's staff to evaluate all aspects of flooding, erosion and stormwater control throughout the 524 square mile MSD boundaries.

In March 2008, MSD retained Reitz & Jens to provide an emergency evaluation and design to stabilize 20-foot high banks along a 1200± foot long 180° bend in Fishpot Creek that was threatening homes along Pepperdine Court and Vance Road, a major County thoroughfare. The project required a complete geomorphic, hydraulic, geotechnical and sediment transport analysis of the existing conditions through this reach to develop stabilization improvements that protected the threatened infrastructure without impacting natural stream processes. Temporary toe stabilization of the banks was designed, permitted, and installed by June 2008. The long term stabilization included backsloping and biostabilization of two channel reaches with a series of rock vanes to control flows between the stabilized high banks. The long term improvements were designed, permitted, and bid in October 2008; construction began in January 2009 and was completed in April 2009 at an estimated total of $1 million. This project was selected by the Missouri Consulting Engineers Council for a 2011 Honor Award. Additional information about this project can be found on the web by searching for "Fishpot Creek" at www.youtube.com .

"Exceptional attention to detail showed in all documents submitted to review. This is the way the process is supposed to work."

Pamela Huntoon

Brian Hoelscher, Executive Director
314.768.6245

Spring Creek Wastewater Treatment Plant LOMR

Springfield Metro Sanitary District

As the construction of SMSD's new wastewater treatment plant was wrapping up in 2012, the District evaluated its flood insurance needs as it was taking final acceptance of the new work. Since a portion of the project involved both floodplain fill and floodway modifications, the District understood that their flood insurance premiums would be considerable until the proper map revisions were made with FEMA. CMT worked closely with the District to map out the appropriate steps needed to expedite the coordination with FEMA.

Realizing that floodproofing credits were available, CMT first generated FEMA Floodproofing Certificates for five structures in order for the District to receive discounted flood insurance while the Letter of Map Revision (LOMR) application was being processed. Knowing that the LOMR process had the potential for long review cycles with FEMA, the District then decided to expedite the process as much as possible by pursuing Letters of Map Revision Based Upon Fill (LOMR-Fs) for the four structures that were constructed in the floodplain but did not impact the jurisdictional floodway. CMT submitted the LOMR-Fs in May 2012 and FEMA issued their determination letters in September 2012.

As the LOMR-Fs were being processed, CMT continued work on the LOMR so that the Flood Insurance Rate Map (FIRM) would be updated and the final building would be removed from the floodplain. This building was located immediately adjacent to Spring Creek where the fill required to place this structure above the flood protection elevation impacted the floodway of Spring Creek. CMT had previously permitted the fill placement and floodway revision with the Illinois Department of Natural Resources – Office of Water Resources.

In order to complete the LOMR application, CMT requested and received the latest HEC-RAS model from the FEMA engineering library. The geometry of the model was updated with the pre-project topography in order to establish the corrected effective model. With the pre-project condition set, CMT then generated a new post-project model with cross-sections based upon the new plant construction. In the post-project condition, the base flood water-surface elevation was lowered by over 0.7 inch at the project site. As such, we had to provide detailed modeling over 20,000 feet upstream in order to tie-in to the corrected model within FEMA's tolerances (0.5 inch). In addition to the HEC-RAS modeling, CMT generated updated work maps that delineated the pre-project and post-project floodplain and floodway limits. After several rounds of comments from both FEMA's technical services contractor and the Illinois State Water Survey, FEMA's cooperating technical mapping partner, CMT received approval of both the modeling and the mapping. With this approval, CMT then coordinated the required public notices and legal notices with both the City of Springfield and Sangamon County. The final determination from FEMA was issued on May 14, 2015.

"I would tell, and have told others, there is no one else I want doing my plant work... I feel I have the best team looking out for the district and its facilities."

Gregg Humphrey, PE, Director/ Engineer
Springfield Metro Sanitary District

Gregg Humphrey,
Director/ Engineer
217.528.0491

PROPOSAL

ENGINEERING STUDY FOR THE COMPTON DRIVE WASTEWATER TREATMENT PLANT FLOOD PROTECTION IMPROVEMENTS

March 11, 2016

TranSystems

EXPERIENCE | Transportation

TranSystems

2400 Pershing Road
Suite 400
Kansas City, MO 64108
Tel 816 329 8600
Fax 816 329 8601

www.transystems.com

March 10, 2016

Mr. David H. Miller, PE
City Engineer
City of Branson
110 W. Maddox, Suite 310
Branson, MO 65616

RE: Compton Drive Wastewater Treatment Plant Flood Protection Improvements

Dear Mr. Miller,

Thank you for the opportunity to present our proposal for this project. Our team consists of TranSystems as the prime consultant, with Water Resources Solutions, LLC as a subconsultant. We offer the following distinct advantages:

- **Commitment** – We have assigned **Aaron Moore, PE,** as the project manager for this project. Aaron has managed numerous projects that analyze flood impacts on infrastructure. Assisting Aaron will be **Donald Baker, PE** of **Water Resources Solutions, LLC**. In addition to being a nationally recognized expert in levee analysis and design, Don brings significant value engineering experience to the team. **Shawn Turner, PE,** will serve as the Client Manager for Branson. Shawn has worked with numerous municipalities in this capacity, is accustomed to providing assistance as needed to maintain projects on a successful track toward completion, and has significant experience in wastewater treatment design.
- **Familiarity** – We are currently working throughout southwest Missouri on a variety of projects, and have recently established an office in Joplin. We also have past experience working for the City of Branson.
- **Project Funding** - We have significant experience in assisting municipalities in obtaining grants and loans to construct projects. We do not want to conduct a study, or complete a design that cannot obtain funding for construction. Through our experience, we have learned to conduct engineering studies and complete design, to maximize the client's ability to obtain funding. We recently assisted the City of Joplin in obtaining a $17 million TIGER grant to construct a variety of projects.

It would be our great pleasure to work with the City of Branson again and we look forward to discussing this project with you further. Please feel free to contact me at (816) 329-8600 or sdturner@transystems.com with any questions or to schedule a meeting.

Very Truly Yours,

Shawn Turner, PE
Vice President

TranSystems
Analyze, Adapt, Solve.

TranSystems provides innovative solutions, and our local technical depth is matched by our consulting expertise of nearly 900 professionals in 34 offices located across the U.S. TranSystems is the premiere municipal service provider for all engineering needs.

This project will be managed from our Kansas City, MO office, with support from team members in our Independence, KS, and Joplin, MO offices.

TranSystems provides an extensive range of capabilities, and our experienced engineers have successfully completed projects of various scale and complexity nationwide. Our project experience has provided our engineers with trained eyes in finding opportunities and capitalizing on them; but most importantly, TranSystems provides quality engineering services to get the job done right.

TranSystems Team

Joining the TranSystems team will be **Water Resources Solutions**, LLC, a certified W/DBE firm. TranSystems and Water Resources Solutions are currently working together on the hydraulics associated with a crossing over the Mississippi River in St. Louis, and have developed a close relationship over the years. The team members from Water Resources Solutions will bring valuable experience to the city in this project from both a QA/QC standpoint as well as the value engineering processes.

Aaron Moore, PE will be our Project Manager on this project and will be committed to the city's needs from inception to completion. Aaron has successfully managed multiple projects with complex hydraulic design challenges in urban areas. He and his team have experience with projects of this nature and understand FEMA's National Flood Insurance Program.

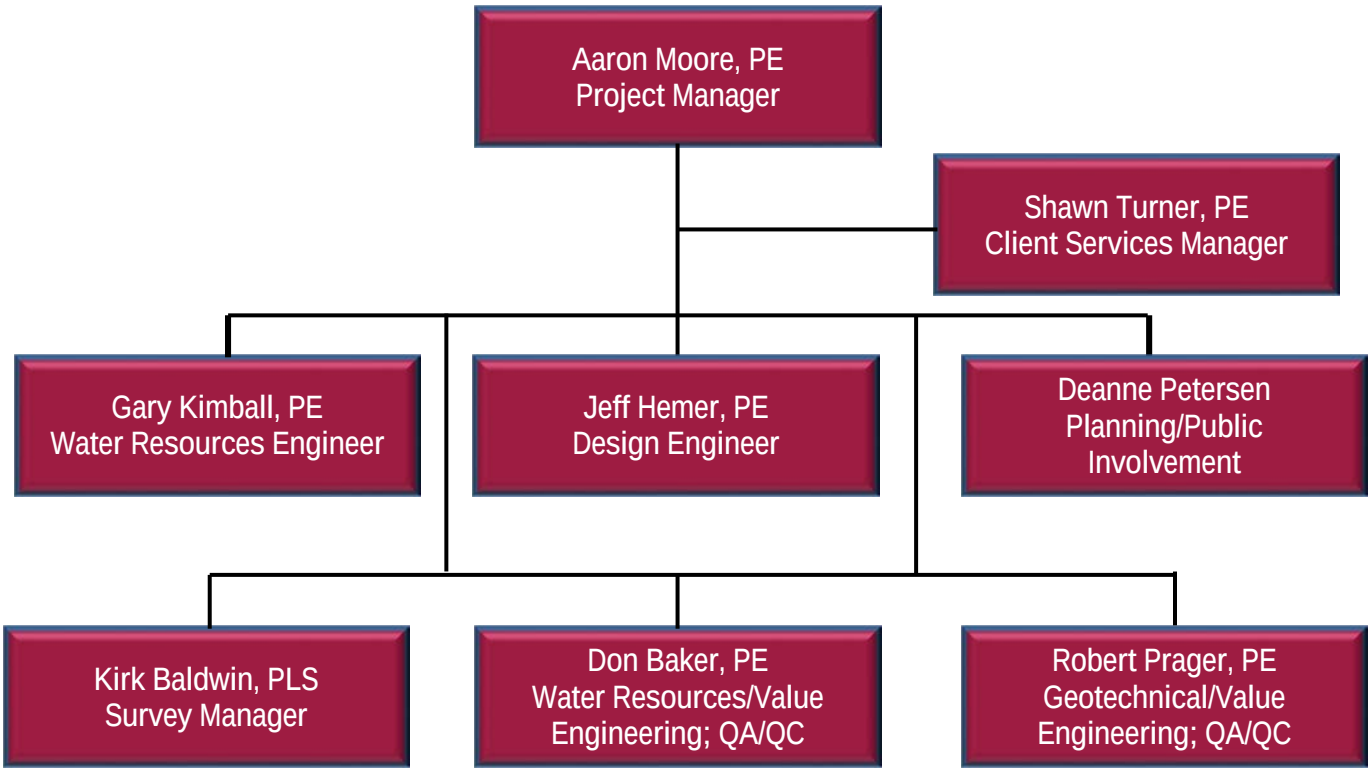
Committed Staff

The staff members shown in this proposal will be available for their roles on this project from start to finish. We use a sophisticated staff management tool that allows us to closely track our staff's workload and provide place holders for their upcoming work on any particular project. We have found that by using our Project Performance Management tool, we are able to balance our workload and improve our delivery process.

TranSystems understands the importance of the project schedule. Project Manager, Aaron Moore and Client Services Manager, Shawn Turner will regularly monitor progress to ensure the project needs are being met. Our team will also frequently communicate with city staff to receive feedback and address any concerns. If appropriate, we'll make adjustments to ensure the project has the necessary resources to maintain the schedule.

Project Team

Our project team has been designed to allow seamless communication and the best technical resources.



Aaron Moore, PE | Project Manager

Aaron has served as project design engineer and project manager, responsible for the completion of hydrologic and hydraulic studies and design for numerous local and state agencies as well as multiple Class I railroad clients. He joined TranSystems in 2010 specializing in hydrologic and hydraulic engineering design and is leader of the TranSystems Water Resources Team. His experience as a civil engineer includes hydraulic modeling, storm water planning and design, hydraulic structures design, FEMA floodplain analysis studies including No-Rise Certifications and CLOMR/LOMR submittals, and water quality studies. Aaron is also a Certified Professional in Erosion and Sediment Control (CPESC) and has experience in preparing NPDES documents such as erosion control plans and storm water pollution prevention plans.

Shawn Turner, PE | Client Services Manager

Shawn leads our Joplin, MO and Independence, KS offices, utilizing his extensive experience in all facets of municipal engineering. He has a great deal of experience managing and designing non-typical projects with a variety of state and federal funding. Shawn's dedication to his clients consistently has a positive impact on the project team. Additionally, Shawn brings experience with wastewater treatment facility design, having served as a design engineer or project manager for improvements to over 50 wastewater treatment facilities in Kansas and Missouri. Under previous employment, Shawn served as lead engineer for the design of improvements to the Cassville, Missouri, WWTF, which

is located in the Table Rock Basin. Improvements to this facility included the addition of biological nutrient removal, chemical coagulation, and filtration to reduce phosphorous discharge limits to an extremely low level.

Gary Kimball, PE | Water Resources Engineer

Gary is a licensed engineer in the TranSystems Water Resources Team with 10 years of experience performing hydrologic and hydraulic studies for our most complex projects. These studies include hydrologic and hydraulic design for bridges over several major river crossings including the Rio Grande, the Platte River in Nebraska, the Grand River in Missouri, the Yellowstone River in Montana, and the Mississippi and Missouri rivers. His specialized training includes geographic information systems (GIS), geomorphic analysis, one-dimensional and two-dimensional hydraulic modeling, storm sewer design, detention pond design, sediment transport analysis, bridge scour analysis, scour countermeasure design, floodplain mapping, and floodplain development permitting.

Jeff Hemer, PE | Design Engineer

Jeff specializes in structural design and equipment integration and has served as the lead designer on a wide range of projects including multiple wastewater treatment plants, influent lift stations, and peak flow storm water pump stations. Jeff has the technical background to work closely with equipment manufacturers and efficiently select pumps, piping, and related components which meet the design criteria of the projects. Jeff is well versed in design procedures and the loads associated with flood walls and earthen levees. Prior to joining TranSystems, Jeff managed projects for the Duckett Creek Wastewater Pumping Station in St. Charles, MO, and the Lee's Summit, MO Wastewater Pumping Station. The scope of the latter project was to fix the high inflow and infiltration flows into the sanitary sewer system during rainfall events.

Deanne Petersen | Planning/Public Involvement

Deanne joined TranSystems in June 2014 after receiving her Master of Regional and Community Planning from Kansas State University. She has both local government and metropolitan planning organization experience from her previous intern positions. She graduated with high honors, receiving the distinguished ARCC King Medal and American Institute of Certified Planners (AICP) Outstanding Student Award. Deanne has experience with transportation and land use planning, GIS analysis, communication and graphics, and public engagement strategies.

Kirk Baldwin, PLS | Survey Manager

During more than 20 years of experience in the field of Land Surveying, Kirk has overseen and worked as both survey manager and project land surveyor on several Kansas and Missouri projects for highway engineering design, site development, large scale boundary projects, and individual small projects. His experience with both public and private clients includes right-of-way determinations, property boundary line determinations, easement and deed preparations, topographic map preparations, clientele contract negotiations, project pricing, employee training and evaluations, construction calculations and constructions surveying layout. Kirk is very familiar with the greater Branson, MO area having performed multiple surveys in the area.

Don Baker, PE | Water Resources Engineer, Value Engineering, QA/QC *(Water Resources Solutions)*

Don Baker is Principal and Owner of Water Resources Solutions, LLC in Prairie Village, Kansas. He is a Professional Engineer registered in Kansas, Missouri, Colorado, Wyoming, Nebraska, Montana, Illinois, Oregon, North Dakota, and California. Don holds the prestigious Diplomate, Water Resource Engineering that was awarded to him by the American Academy of Water Resources Engineers. He is an Adjunct Instructor for the Civil and Mechanical Engineering Department at the University of Missouri – Kansas City where he teaches Fluid Mechanics, Hydraulics of Open Channels, Hydraulic Structures and Urban Hydrology. In addition, he teaches continuing education courses for Auburn University that include Design and Analysis of Storm Water Detention Facilities and Open Channel Hydraulics. Don has 24 years of water resources engineering experience and specializes in storm water management, ecosystem

restoration, watershed management and hydraulic structures. With his experience in water resources across the U.S., he is able to bring a variety of solutions to the project and ensure that a quality solution is found.

Robert Prager, PE | Water Resources Engineer, Value Engineering, QA/QC *(Water Resources Solutions)*

Robert is an expert in water resources projects. This expertise is evidenced by frequent requests to lead or serve on value engineering teams, review of a textbook for American Society of Civil Engineers Press and extensive publication. He was instrumental in the preparation of the Kansas City Metropolitan Chapter of the American Public Works Association Specification Section 5605, Natural Streams and similar standards throughout the Midwest. His engineering, managerial, and value methodology experience spans 39 years and much of the globe. For the past 20 years he has applied his expertise to analysis and design of flood mitigation and stream and river recovery projects and value methodology. He has prepared numerous watershed master plans and designed over 20 major reservoirs and dams, several near 30 meters high. His career began with the forensic investigation of a major hydroelectric dam failure and continued with design of large water resource projects including responsible engineer positions on four hydroelectric and two coal-fired power plants. He was the geotechnical response engineer for a nuclear power plant. His design approach is grounded in engineering, fluvial geomorphology, geology, and life sciences. He is well versed in watershed management, stream bank and bed erosion assessments, planning and design of flood control, soil bioengineering, hydraulic structures, canals, levee projects, dams, and groundwater assessments.

Project Experience

We invite you to contact the reference for each project shown to get an idea of how TranSystems completes related projects on time and at or under budget.

BNSF Mississippi and Missouri River Basin Reporting and Forecasting | Kansas City, MO | Ajibade Fashola (817) 352-1000 | Completion 2015
TranSystems provided engineering/support services for development of a 2015 Mississippi and Missouri River Condition Report and Forecast that helped the railroad with resources allocation and prioritization. TranSystems gathered, analyzed, and reported information from United States Geological Survey, National Oceanic and Atmospheric Administration, National Weather Service, US Department of Agriculture, and US Army Corps of Engineers, then evaluated and assessed potential flood risk to BNSF operations within the rivers' basins, which span several states based on current and forecasted conditions.

BNSF Plattsmouth Missouri River Bridge 3.8 | Plattsmouth, NE | Ronald Berry (913) 551-4181 | Construction Cost $75,000,000 | Completion February 2012
To meet increasing shipping needs and relieve the aging bridge built in 1879/1902 over the Missouri River near Plattsmouth, NE, TranSystems completed the design and construction management for the new single-tracked, 11-span, 1,682-ft. bridge. The west approach cut included nearly 85,000-ft.^{2} of soil-nail wall with benched upper slopes to reduce right-of-way requirements. The east approach consisted of embankment within the Missouri River floodplain. The project included nearly 2.3 miles of new track construction and the relocation of three 30" high pressure natural gas mains that feed the majority of Nebraska natural gas customers. Our team performed the hydraulic analysis for the Missouri River crossing on existing, proposed, and temporary conditions and helped the contactor avoid adversely impacting adjacent structures during construction. Key geotechnical design challenges included development of a combined near vertical loess cut and soil-nail wall configuration to provide the proposed 100-ft. cut within the current BNSF right-of-way and constructing high embankments up to 52 ft. upon soft alluvial soils. Other geotechnical issues addressed during the design included evaluation of rock scour, modification to existing USACE levees, and driven pile/drilled shaft foundations for bridge support.

US-77 Bridge over Timber Creek | Winfield, KS | KDOT | David Nagy (785) 296-0930 | Construction Cost $5,900,000 | Completion August 2015
TranSystems completed a discovery phase investigation, preliminary, and final design for this 320 foot three-span bridge over Timber Creek. Funding was secured for construction of the bridge. The project included a levee seepage analysis, levee repairs, and completion of the 408 Permit. Close coordination with the USACE was essential for the project success. Due to the proximity of the bridge to Walnut River, hydraulic analyses were completed for both Timber Creek and the Walnut River.

BNSF 2011 Missouri River Flood Impact Study | Kansas City, MO | Tom Schmidt (913) 551-4330 | Construction Cost $60,000,000 | Completion July 2013
The Missouri River is regulated by the United States Army Corps of Engineers and during the summer of 2011, the Corps announced they would open the flood gates at no fewer than six dams due to record levels of snowpack and multiple months of record rainfall. During the month of May alone, the total runoff was the highest seen since the historic flooding of 1952. This unprecedented release of floodwaters created a significant amount of flooding along the Missouri River directly impacting the BNSF, which operates along a rail corridor running parallel to the Missouri River.

As a result, the BNSF retained TranSystems to provide hydraulic modeling analysis integrated with GIS capabilities to BNSF for their rail corridor between Omaha, NE and Kansas City, MO. This project began as emergency flood response along areas of the BNSF rail corridor, which could be potentially impacted by floodwaters, but quickly morphed into a hands-on-exercise of proactively fighting and predicting floodwaters, showcasing the importance of understanding the dynamic nature of the event and the ever-changing needs of the BNSF. To help protect over 200 miles of BNSF infrastructure, TranSystems provided real-time hydraulic analysis showing both the immediate floodwater levels and future levels several days in advance.

The BNSF faced multiple critical decisions daily during the flood, requiring TranSystems to continually adapt to the fluid nature of the event to provide accurate and timely recommendations. Based on the recommendations from TranSystems, the BNSF implemented approximately $60 million in construction including temporary levees that allowed critical mainlines to remain in operation during the flood, ultimately saving hundreds of millions in lost revenue, infrastructure, and rolling stock.

Neches River Bridge | Beaumont, TX | Texas DOT | Matt Barkley (703) 317-6220 | Completion 2017 (est.)
TranSystems is providing conceptual engineering services for development of four rail alternatives, development of environmental constraint maps, an environmental document and supporting technical report, stakeholder and public involvement, and topographic surveying and mapping for a railway project located in Beaumont, TX, crossing the Neches River. The Neches River is a major navigation channel for many barges and cargo ships with complex hydraulic features from the Gulf of Mexico through Beaumont. Our hydraulic engineers developed one and two-dimensional hydraulic models to aid the design process in minimizing hydraulic and scour impacts to the adjacent structure.

UPRR – Stockton, CA Rail Welding Facility | Stockton, CA | Steven Thomas (402) 544-8532 | Construction Cost $10,000,000 | Completion Date 2016 (est.)
TranSystems is providing professional engineering services to Union Pacific Railroad (UPRR) on a rail welding facility at the Port of Stockton Rough and Ready Island. Scope of work includes survey, geotechnical investigation, hydrology and hydraulics, site and track design, structural and architectural design, electrical design and permitting. The project required a FEMA map revision due to impacts on the existing floodplain. Our hydraulic engineers performed the analysis and prepared the submittals to the local floodplain administration and FEMA efficiently guiding the UPRR through the process.

UPRR Car Build Facilities | De Soto, MO | Ryan Gottsch (402) 544-5661 | Construction Cost $17,000,000 | Completion 2016 (est.)
TranSystems is providing design for capacity expansion and new car build facilities at the De Soto Yard. Design and construction included multiple new buildings and service tracks; however, prior to construction a Letter of Map Amendment was required through FEMA to remove a portion of the project extents from the mapped floodway. This was necessary as Joachim Creek was incorrectly mapped placing the UPRR facility in the floodway. TranSystems navigated the UPRR through the process and successfully updated the flood insurance rate map for the community.

Levee and Flood Gate Study | Independence, KS | Micky Webb (620) 332-2506 | Completion September 2011
The City of Independence wanted to determine if the existing flood gate and levee provided protection for existing residences during flood events. The city hired TranSystems to perform a hydrologic and hydraulic study, which included a limited amount of surveying in the basin. HEC-RAS software was utilized to calculate water surface elevations of flood events up to and including the 100-year event on the Verdigris River. This study provided data to use in the Operation and Maintenance manual for the flood gate.

Levee Sewer Outfall Inspections | Kansas City, MO | Richard Gaskins (816) 513-0359 | Completion February 2012
TranSystems provided inspections for the Kansas City's levee sewer outfalls. The scope of work included initial field reconnaissance, survey markings, pipe inspections, geotechnical inspection of levee crossings, and cataloging data for future use. All information collected was cataloged in a project specific GIS web-based application to deliver a "living" project status tool to the city, and a cost estimate of recommended repairs was prepared.

Indefinite Delivery A/E Contract for Dam and Levee Inspections | Water Resources Solutions | USACE | Sub to Affinis Corp. | Rick Worrel (913) 239-1100 | Completion Ongoing
Water Resources Solutions is part of a multi-discipline team that is carrying out dam and levee inspections for USACE. Activities include conducting engineering and/or periodic inspections of USACE water-retaining structures and associated appurtenant structures. USACE structures include levees, earthen dams, concrete gravity dams, river locks, pump stations, spillways, and bridges. For the levees, results of our inspections were entered into the Levee Inspection Systems (LIS) database. Inspections are being completed on federally owned or federally constructed, but locally owned, levees and dams. In addition to the field inspections, WRS reviewed as-constructed information, recommended repairs and improvements, assisted in the preparation of draft and final inspection reports, and completed independent technical reviews of the reports.

Double Ditch Bank Stabilization | Water Resources Solutions | Bismarck, ND | Fern Swenson (701) 328-2666 | Completion Ongoing
Over the past several years, the left descending bank of the Missouri River has been eroding, which is now threatening the main Double Ditch Historic Site in Bismarck. The observed changes have become more dramatic in the past couple years, as large areas of river bank have slumped into the river. The slide area is approximately 2,500 feet long and approximately 50 feet high. More than 10 documented burials have been exposed and/or lost due to this erosion. Water Resources Solutions is directing a geotechnical investigation program that includes multiple borings and laboratory tests. Based on the investigation WRS will complete a stability analysis for 2,500 feet of river bank slope. Based on this stability analysis, WRS has completed the preliminary design for the stable slope design and the associated recreational trail. WRS assisted with the river engineering to protect the toe of the slope. This preliminary design consisted of bendway weirs and longitudinal peaked toe stone protection.

Project Understanding and Approach

Providing protection during extreme flooding is critical to the safety and well-being of a community. Allowing critical public services to remain operational during a flood event enables emergency resources to allocate effort to other areas that may be in need of assistance. TranSystems is excited to assist the City of Branson by providing concepts of flood protection alternatives for the Compton Drive Wastewater Treatment Plant. Our Team has completed several

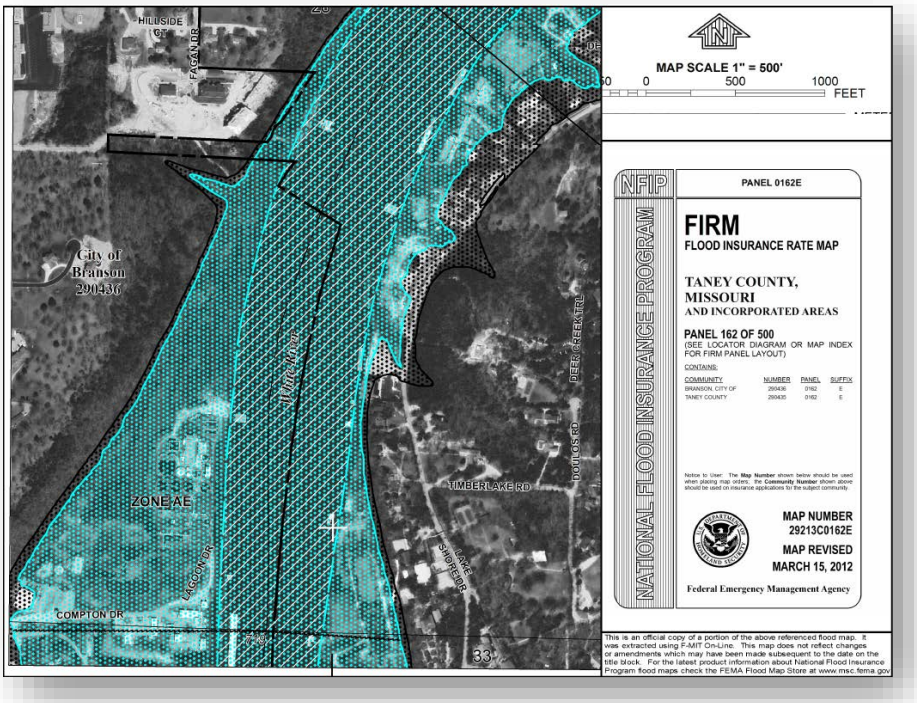
projects that presented an array of diverse hydraulic and environmental impacts. TranSystems' expertise in water resources, wastewater treatment plant design, and environmental monitoring and documentation will prove to be a valuable asset in assuring that the appropriate options are identified and the proper solution is reached.

The Compton Drive Wastewater Treatment Plant has been in operation since 1988. It is designed to treat 5.3 million gallons of wastewater per day. The facility is located next to Lake Tanycomo on approximately 4 acres of land that is equal or lower in elevation than the surrounding terrain. The base flood elevation associated with Lake Tanycomo and the White River at this location is approximately 719 feet according to the FEMA Flood Insurance Study for Taney County dated March 15, 2015. A flood of this magnitude would likely put the existing plant out of operation by inundating the area with several feet of flood water. The current means of flood protection for the facility consists of an earthen levee. The existing levee appears to have been put in place during the initial construction of the Compton Wastewater Treatment Plant. The southernmost beginning point of the existing levee is located at the existing influent pumping station. From this pumping station, the levee is constructed eastward toward Lake Tanycomo, and then turns north paralleling the lake. The levee then turns west, and appears to terminate inside the existing facility. Access to the facility is made by way of Compton Drive, which merges into a road to the facility that is located on top of the levee along the portion paralleling the lake. Compton Drive currently overtops near the Community Building.

Floodplain Assessment and Management

It is apparent that flood events in the area are occurring more frequently than ever before causing increased discharge and water surface elevation in the White River and Lake Tanycomo. The Table Rock Lake Dam is also operating at higher discharges more frequently as some of the highest pool elevations in the history of the lake have occurred over the last 5 years. Information from city staff indicates that the flood event that occurred in December 2015 resulted in a maximum flow rate of 72,000 cfs. This flow rate corresponds to a flood frequency event between 25 years and 50 years. During this event, the flood water elevation was at the top of the existing levee protecting the Compton Drive Wastewater Treatment Plant. Any increase in flow and water surface elevation would have likely overtopped the existing levee.

The FEMA base flood elevation corresponds to a 100-year flood frequency event having a discharge of approximately 148,000 cfs. Increasing the levee height to withstand larger flood events will likely have some impact on the published base flood elevations and will require coordination with local landowners and FEMA. It does appear that the White River experiences a topographic pinch point downstream, which may benefit the project if there is backwater being generated during large floods that propagate through the project location. If the project adversely impacts base flood elevations we may need to explore alternative options to mitigate the impact to the public such as proposing a one-time buyout program to absolve the city from liability to property damage.



Our goal will be to minimize the amount of floodplain impact the project will have and provide a level of protection that satisfies the city's needs. We will work with the city to determine an appropriate design flood event for the proposed flood protection and ensure that all proposed options are discussed thoroughly and vetted prior to any public involvement. One of the factors that will play into this important decision is the National Flood Insurance criteria in determining if the wastewater treatment plant is deemed as a critical facility and the required protection of a critical facility. Presidential Executive Order 11988 requires critical facilities to be protected to the 500-year flood event. In this case it is likely not feasible to provide that level of protection due to the extreme water surface elevations associated with an event of that magnitude. Other factors influencing the design flood decision are related to the economics of the project.

Wastewater Treatment Plant Infrastructure

TranSystems' first concept will be to limit the amount of proposed flood protection to the wastewater treatment facility and forgo protection of adjacent properties such as the recycling center, golf course, and public works shops. This approach is similar to the existing levee alignment and will likely be the most economically friendly and would likely have the least hydraulic impact on the White River. One variation will be to include the filtration building within the proposed flood protection.

It is our understanding that the existing facilities were constructed on piling driven to bedrock, although a more recent addition utilized rammed aggregate pier system also known as Geopiers. The filtration building was built during the addition. Since this facility sits outside of the existing levee conduit is required to run through the levee system, which could provide a path for water to penetrate the levee system during a flood. We will evaluate encompassing the filtration building with the proposed flood protection solution to prevent this from occurring. The wet wells installed during the more recent addition to the facility to serve as groundwater collection will be evaluated to verify that they're serving their purpose effectively. Part of this effort will include a literature review of groundwater studies for the area to determine the availability of groundwater conveyance information. We will review any well pump tests that are available for wells on the property or for properties nearby and calculate the groundwater transmissivity to the level of effort required to manage the groundwater level. If sufficient information is not available, it is possible that we could drill one or two temporary test wells on which to run pump tests to calculate the groundwater transmissivity. Our team will also determine the capacity of the pump required to handle the groundwater within the wells and compare against what is

currently in place. If the existing pumps appear inadequate we will address that issue by recommending the appropriate pumping system that should be utilized.

In addition to groundwater concerns, there may be seepage that is occurring under the existing levee. We will analyze the existing levee design and determine whether the seepage may be impacting the integrity of the levee so the appropriate course of action can be taken. Based on what we know now, we may have to design a significant cutoff trench below the proposed levee. Otherwise, it is possible that groundwater under the influence of the adjacent river level could be forced up through the check valves located in all deep structures.

Cost Analysis and Funding

Our team is aware that a project of this nature will be very expensive and time consuming; therefore, we are already examining and brainstorming tentative flood protection measures that could be undertaken rapidly and at lower costs to prevent damage from occurring prior to a permanent solution being finalized.

During our study of proposed alternatives we will determine the life cycle costs related to constructing facilities to FEMA requirements versus constructing to a lower level of protection. The risk associated with these events will be determined in order to weigh the value of increased protection and FEMA certification. Regardless of our findings, we will work to find a solution that will meet the needs of the city and protect the critical service of providing wastewater treatment without interruption and preserving the recreational environment of Lake Tanycomo after a flood event recedes.

We have assisted municipalities in obtaining nearly every type of state and federal funds to finance virtually every type of municipal infrastructure improvement project. In Joplin, we are currently working on infrastructure projects that include funding from:

1) Community Development Block Grant-Disaster Recovery.
2) Earmarked Missouri Department of Economic Development funds.
3) TIGER Grants.
4) Capital Improvement sales taxes

We have also assisted cities in obtaining MDNR Revolving Loan Funds, and accompanying grants, which is a very likely source of funding for this project. We have assisted cities in establishing a variety of mechanisms to generate debt service for these loans, or conventional General Obligation and Revenue Bonds. These mechanisms include increases in sewage user fees, sales taxes and property taxes.

Shawn Turner has had great success assisting municipalities obtaining funding for wastewater treatment improvements. For the Independence, KS, Wastewater Treatment Facility, which needed more than $10 million in improvements, Shawn assisted the city in obtaining SRF funding for Phase II improvements, which include the design and construction of the $5 million Southeast Lift Station. For Baxter Springs, KS wastewater treatment and collection system, Shawn assisted the city in obtaining a $400,000 CDBG and an $800,000 SRF loan for lift station improvements. For Cassville, MO, he helped obtain MDNR grants and loans to expand the city's wastewater treatment facility.

Value Engineering

The Society of American Value Engineers has developed a process that has become the standard for the engineering community for value engineering. Both TranSystems and Water Resources Solutions use these Value Engineering methodologies to help clients find the best project solutions for their budget. We generate creative ideas that result in different project alternatives to improve clients' value. Our team members Don Baker and Robert Prager are both certified through Society of American Value Engineers (SAVE) as professional value engineering practitioners.

The Value Methodology consists of six steps that include the Information Phase, Function Analysis Phase, Creative Phase, Evaluation Phase, Development Phase and Presentation Phase. Value Engineering is a process that allows for the solution that provides the best value to be identified. Value is defined as the amount of resources required versus the function or benefit of the solution. While costs are often reduced through the process, it is important to understand that Value Engineering is not cost-cutting. We propose to use this process on the project in order to streamline the alternatives analysis process and shorten the overall schedule of the project by identifying the best value solution for the project in a concise and focused manner.

Public Involvement

We have learned that public involvement is a continuous task that does not simply end after the planning process. While websites and social media are a useful tool, when a project develops negative connotations, face-to-face meetings with those impacted by the project are very important. One of our first efforts envisions on-site meetings at the completion of concept designs with property owners. Since the flood protection improvements may impact properties both upstream and downstream, a targeted public involvement process will help alleviate concerns and attain community buy-in. The public involvement process will specifically focus on areas such as the Lakewood Estates condominiums and nearly 100 single-family residences immediately south of the Compton Drive Wastewater Treatment Plant. This style of 'meeting the public' also allows city staff and elected officials to discuss the project in an informal manner, if desired. As we move through the design process, we envision additional meetings on site with adjacent landowners as problems are vetted, listening to their concerns, and addressing them as appropriate.

A key issue throughout the project will likely be the public's perception of the project and potential impacts to local properties outside the protection of the levee improvements. Several of the nearby homes appear to be slightly under the current 100-year flood elevation, and the position of these properties will likely not improve after implementation of the flood protection. Therefore, it will be critical to communicate the risks and benefits associated with various improvement concepts. To advance community buy-in, the city could also consider mitigation techniques such as isolated landscape berms in the impacted neighborhoods to prevent flooding issues during smaller, frequent events. Although we previously mentioned the option of a buy-out program, other mitigation techniques to explore could include more stringent floodplain development requirements with the National Flood Insurance Program's Community Ration system that could help reduce flood insurance rates or earmarking public funds to make certain properties more resilient to flooding events in the future. The feasibility of which option is most attractive likely rests on the magnitude of the impact the project will have, inches of increase in water surface elevation versus feet!

To address resident concerns, area-specific meetings at key points in the project could be held at a local community destination such as the Branson Community Center. These meetings would allow the project team to relay information as well as provide residents with an opportunity to offer feedback and interact with the project team. With a specific, targeted audience, the distribution of passive education materials could also be an effective tool to keep residents informed throughout the process.

We have significant experience in all forms of public involvement. Overall, our public involvement approach emphasizes resident engagement throughout the process to connect them to resources and project information, build consensus around improvement concepts, and mutually address flooding issues in their community.

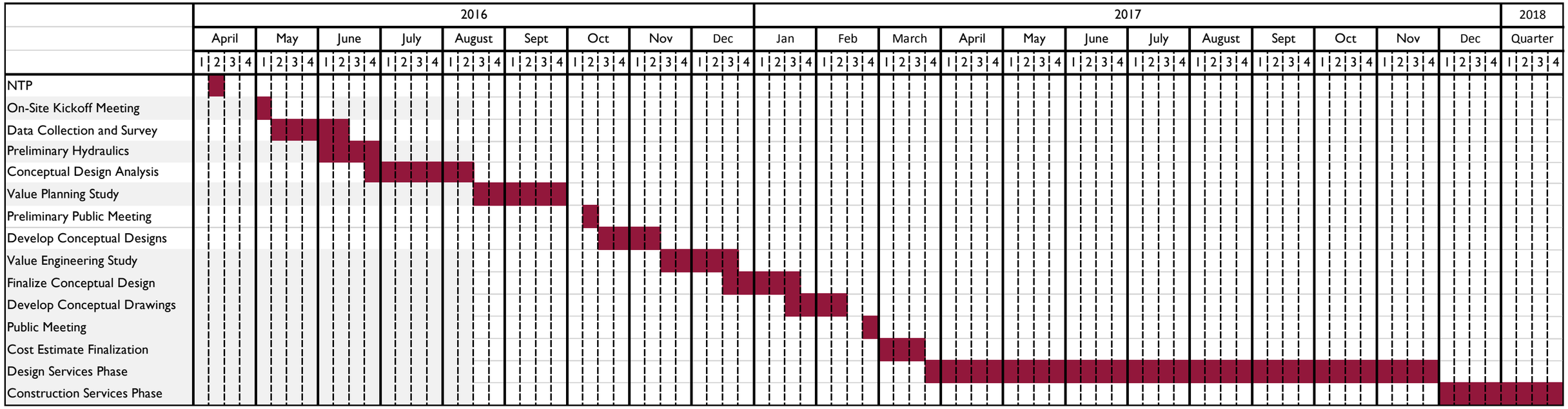
Quality Control

TranSystems has a well-established process to manage our projects. We develop a project work flow plan, a design schedule and design task budgets before we start work and monitor each on a weekly basis. We communicate with staff and subconsultants, informing them of what we need and when we need it. If appropriate, we make adjustments to the individual pieces, yet maintain the overall schedule and budget.

Project management for each project must be unique. We adapt our style of communication to what works for you and your preferred method to receive information. Whether we use email, or written weekly updates, we have prepared a wide range of tools to communicate with you and will tailor our methods to what works best for you.

We will also prepare a project-specific quality assurance plan. Our philosophy is to check all calculations and deliverables close to the source. First, each employee checks their work. Then, prior to the information being used by another party, the task leader will check the work. Third, the project manager and QA engineers will review the information and how it corresponds with other aspects of the project. Lastly, we will conduct a constructability review with one of our construction managers

Schedule


2016
2017
2018
April
May
June
July
August
Sept
Oct
Nov
Dec
Jan
Feb
March
April
May
June
July
August
Sept
Oct
Nov
Dec
Quarter
1 2 3 4
NTP
On-Site Kickoff Meeting
Data Collection and Survey
Preliminary Hydraulics
Conceptual Design Analysis
Value Planning Study
Preliminary Public Meeting
Develop Conceptual Designs
Value Engineering Study
Finalize Conceptual Design
Develop Conceptual Drawings
Public Meeting
Cost Estimate Finalization
Design Services Phase
Construction Services Phase

TranSystems

EXPERIENCE | Transportation

REQUEST FOR PROPOSAL
STATEMENT OF QUALIFICATIONS

FOR

ENGINEERING SERVICES FOR ENGINEERING STUDY FOR THE COMPTON ROAD WASTEWATER TREATMENT PLANT FLOOD PROTECTION IMPROVEMENTS

CITY OF BRANSON, MISSOURI ENGINEERING/PUBLIC WORKS DEPARTMENT

March 11, 2016

VEENSTRA & KIMM, INC.

VEENSTRA & KIMM, INC.
1201 W College St., Suite 100 • Liberty, MO 64068-1065
816-781-6182 • 816-781-0643(FAX) • 855-241-8011(WATS)

March, 11, 2016

David H. Miller, P.E.
City Engineer
City of Branson
110 W. Maddux, Suite 310
Branson, Missouri 65616

REQUEST FOR PROPOSALS
ENGINEERING STUDY FOR THE COMPTON ROAD
WASTEWATER TREATMENT PLANT FLOOD PROTECTION IMPROVEMENTS

One (1) print copy and a PDF file on CD of the Veenstra & Kimm, Inc. Statement of Qualifications for Engineering Services for the Engineering Study are submitted for consideration by you and members of the Selection Committee. We are pleased to provide this Statement of Qualifications in response to your Request for Proposals and welcome the opportunity to work with you on this project.

Dave McDonald, P.E., who is the Office Manager of the Liberty office, will serve as the Project Principal for our Team and will help in providing any resources needed in addition to handling any contractual matters. The project will be led by Roger Waltemath, P.E. who is identified as Project Manager and will be your point of contact. Roger will be assisted by LeRoy Rader, P.E. the Project Engineer. Roger and LeRoy have been involved in Flood Insurance Studies and Hydrology and Hydraulic analyses and studies during the past 30 years. Combined they have experience in over 95 Flood Insurance Studies. Our resumes which are included in this response expands on our in-depth experience and expertise we have in flood studies, hydrology and hydraulics.

Veenstra & Kimm, Inc. provides a broad range of civil, environmental, structural, electrical and mechanical engineering services. Within our broad range of services, hydrology, hydraulics and wastewater related services have remained our largest sector of business over our 54 year history. Veenstra & Kimm, Inc. provides a full range of wastewater related services, including facility planning, sewer system investigations, infiltration/inflow evaluation and rehabilitation, collection system analysis and design, wastewater treatment and flow equalization.

Veenstra & Kimm, Inc. believes our size provides our clients distinct advantages. Our firm is large enough to have staff members with expertise in each areas of engineering needed for this project. On the other hand, our firm is small enough to approach projects with a fully integrated team approach to bring together key staff members that blend specialization with a broader experience and expertise.

If you have any questions or need additional information, please contact Dave McDonald at 816-781-6182 or by email at dmcdonald@v-k.net.

VEENSTRA & KIMM, INC.

Dave McDonald, P.E.
Project Principal

Liberty Office
1201 West College, Suite 100
Liberty, Missouri 64068

816-781-6182
855-241-8011 (Wats)
816-781-0643 (Fax)

Main Office
3000 Westown Parkway
West Des Moines, Iowa 50266

515-225-8000
800-241-8000 (Wats)
515-225-7848 (Fax)

Veenstra & Kimm, Inc. was founded in 1961 as a partnership of Bob Veenstra and Jim Kimm for the practice of consulting engineering. Veenstra & Kimm, Inc. is a Type C corporation. In 1966 the scope of our firm's work was expanded to include municipal planning. Since its founding Veenstra & Kimm, Inc. has grown to our current staff size of 140 serving a variety of municipal, other governmental and private clients. Veenstra & Kimm, Inc.'s main office location is in West Des Moines, Iowa. In addition to the Liberty office, Veenstra & Kimm, Inc. also has branch offices located in Coralville, Mason City, Sioux City (Iowa), Moline, Springfield (Illinois) and Omaha (Nebraska).

On May 27, 2011, the firm of McDonald & Warger, Inc. was acquired by Veenstra & Kimm, Inc. and became the Liberty, Missouri branch office of Veenstra & Kimm, Inc. This merger provides the former firm of McDonald & Warger, Inc. access to the over 140 person staff of Veenstra & Kimm, Inc. to assist in providing design services. This office will continue to provide the same high quality professional design services our clients have come to expect from us. Our design services will be enhanced by the broader based civil engineering experience and qualifications of Veenstra & Kimm, Inc. With the increase in available staff we now have the engineering, technical, business and financial resources to handle the engineering services proposed while meeting any scheduling deadline.

Veenstra & Kimm, Inc.'s Liberty office is a seven person office. The office employees include five professional civil engineers, one engineer intern and one civil engineering technician. Professional registrations of personnel include licenses in the states of Missouri, Kansas, Iowa, Nebraska, Arkansas, Colorado and Arizona. Clients, past and present, include Federal agencies, state highway departments, county and city governments, and private individuals and developers.

Veenstra & Kimm, Inc. provides a broad range of civil, environmental, structural and electrical mechanical engineering services. Within our broad range of services, hydrology, hydraulics and wastewater related services have remained our largest sectors of business over our 54 year history. Veenstra & Kimm, Inc. provides a full range of wastewater related services, including facility planning, sewer system investigations, infiltration/inflow evaluation and rehabilitation, collection system analysis and design, wastewater treatment and flow equalization.

David H. McDonald, PE

Project Principal
41 years of Experience

Mr. McDonald has been involved in many areas of civil engineering with indepth experience in the structural and hydraulic fields. This experience includes the design of all types of steel and concrete bridges. Many of his assignments have involved lead design responsibilities. Field experience encompasses inspection and supervision of construction for roadways, bridges and flood control projects. Mr. McDonald's positions have involved Hydraulic Engineer, Bridge Engineer and Project Engineer.

Mr. McDonald has been engaged in hydrologic and hydraulic studies and in the design and preparation of engineering plans and contract documents throughout his career. His experience includes Flood Plain Information Reports and Flood Insurance Studies located in Missouri, Kansas, Iowa and Florida. His involvement included field reconnaissance, hydrologic and hydraulic analyses, determination of floodways and flood hazard zones, preparation of base maps, work maps and draft text and reports. Mr. McDonald was Project Engineer for the Fort Scott, Kansas and Riley County, Kansas Flood Insurance Restudies.

Also included in Mr. McDonald's experience are channel relocation projects involving the design of flood control structures in Minnesota, Ohio, and Texas. All studies have included extensive use of computer programs HEC-1, HEC-HMS, HEC-2, HEC-RAS, TR-20 and the hydraulic effects of bridges, culverts and flood control structures. Mr. McDonald is familiar with the mechanical design of movable bridges and hydraulic structures. Field experience includes the inspection of watersheds and streams to determine their characteristics, field surveys involving valley, channel and bridge sections, and condition inspection of hydraulic structures. Mr. McDonald has completed the training program provided by the HEC hydrology and hydraulics training videos.

Mr. McDonald was the Hydraulic Design Engineer for the Route 36 - Missouri River Bridge in St. Joseph, Missouri. He designed the deck drainage system for 6500' of bridge which tied into the existing stormsewer system. He also conducted the necessary scour analyses on the main river piers and approach bents.

Mr. McDonald was project engineer for the White Rock Creek Improvements located in Dallas, Texas. The work required the development of flood discharge frequency curves for major drainage structures on the main stem of White Rock Creek. Historical rainfall gage data and stream gage records were used in the analysis of the existing system of the 66 square miles of urban and rural watershed. Future runoff was determined based on the City's proposed Land Use Plan. Recommendations, cost estimates and alternative methods for channel improvements, structure sizes, levees and relief channels were included in the Design Report.

Since initiation of the Federal-Aid Off-System Program in Western Missouri, Mr. McDonald has been Project Manager or Project Engineer for Off-System Bridge Programs in seventeen (17) counties and three (3) cities. These projects have varied in scope from box culvert installations to bridge structure design for major stream crossings. On all assignments, Mr. McDonald was responsible for coordination of engineering and compliance with the requirements of the Federal-Aid Program.

Mr. McDonald has been Project Engineer on several flood insurance studies. A partial list follows:

City of Elk City, Oklahoma
City of Poplar Bluff, Missouri
City of Manhattan, Kansas
City of Lamar, Missouri
City of Fort Scott, Kansas
City of Lindsborg, Kansas
City of Altus, Oklahoma
Warren County, Iowa
City of Indianola, Iowa
City of Kansas City, Kansas
City of Shell Rock, Iowa
City of Tonganoxie, Kansas

City of Steelville, Missouri
Cass County, Missouri
City of Lansing, Kansas
City of Paris, Missouri
City of Granby, Missouri
Leavenworth County, Kansas
City of Albany, Missouri
City of Solomon, Kansas

Roger E. Waltemath, PE

Project Manager
37 years of Experience

Mr. Waltemath has been responsible for various projects including flood plain studies, storm sewer design, erosion control, groundwater investigations and flood protection involving pumping facilities. Mr. Waltemath is familiar with the technical procedures of HEC-2, HEC-RAS, and Bentley StormCad.

Mr. Waltemath's experience also includes the design, detailing and inspection of storm sewers and detention and retention structures. He has conducted storm drainage studies for land developers where flood insurance regulations are in force in order for the developer to receive approval by local governmental agencies in the states of Missouri and Colorado.

Mr. Waltemath was a Hydraulic Design Engineer on the Fort Scott, Kansas Flood Insurance Study. He was involved in the preparation of the computer generated base maps and flood profile sheets. The base maps were used to delineate the flood limits, floodways and insurance zones. The profile sheets were incorporated into the final report. Mr. Waltemath's involvement in the computer generated base maps and flood profiles is in anticipation of future use and requirements related to furnishing digital base maps, work maps, Digital Elevation Models (DEM) and Digital Terrain Models (DTM).

Mr. Waltemath's experience also includes highway and roadway design and construction. While under other employment in Denver, Colorado, he was involved in several roadway projects for the Denver Technological Center. He was a design engineer for a local road and resident engineer for the construction of collector and local roadways in the Center. In Missouri, Mr. Waltemath has designed approach roadways for bridges in Kansas City and several rural counties. He was involved in the design of a roundabout near Sedalia, Missouri. This project was challenging in the fact that traffic on a state highway had to be maintained during the construction of the intersection. Mr. Waltemath has also designed open and closed drainage facilities for streets and roadways in Colorado and Missouri. He has prepared cost estimates and developed and written specifications and bid documents for bridge and roadway projects.

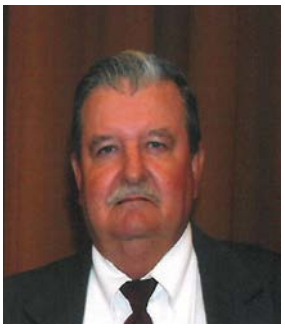
Mr. Waltemath has been involved in preparing digital maps, products and application of Geographic Information Systems (GIS) technology in flood insurance studies. This technology was used in the flood insurance restudies of Rolla, Missouri; Warren County, Iowa; Carlisle, Iowa; Cass County, Missouri; Indianola, Iowa and Lansing, Kansas. He recently acquired certification in the production of DFIRM's by attending a seminar sponsored by the Federal Emergency Management Agency.

Mr. Waltemath has been involved in the preparation of HEC-2 computer input for both the Rolla, Missouri Flood Insurance Restudy and the Poplar Bluff, Missouri Flood Insurance Restudy. He also prepared computer runs for the Fort Scott, Kansas Restudy which involved special bridge and special culvert routines. Mr. Waltemath has recently completed a series of training videos covering the topics of HEC hydrology and hydraulics.

Mr. Waltemath was a design engineer for the Lamar, Missouri and the Lansing, Kansas Flood Insurance Restudies. His responsibilities included determination of flood elevation frequency profiles, identifying the 100 year floodway and the preparation of maps which outline the flood hazard areas.

Mr. Waltemath has also held similar responsibilities on the following flood insurance studies:

Warren County, Iowa
City of Carlisle, Iowa
City of Tonganoxie, Kansas
City of Lansing, Kansas
Cass County, Missouri
City of Paris, Missouri
City of Pevely, Missouri
City of Elk City, Oklahoma
City of Prague, Oklahoma
City of Beebe, Arkansas
City of Cabot, Arkansas
City of Indianola, Iowa
City of Kansas City, Kansas
City of Albany, Missouri
Leavenworth County, Kansas
City of Belton, Missouri
City of Solomon, Kansas
Jefferson County, Missouri
City of Altus, Oklahoma
City of Cherokee Village, Arkansas
City of Cherokee, Oklahoma
City of Little Sioux, Iowa



LeRoy A. Rader, PE

Senior Hydraulic Design Engineer
53 years of Experience

Mr. Rader has a wide range of experience in the fields of hydrologic and hydraulic design, including flood plain modeling using HEC-1, HEC-RAS, HEC-2, HEC-6, HECWRC, NWS, HMS, DAMBRK, SCS TR-20, HMR52, TR-55 and WSP-2. He has completed the Corps of Engineers Flood Plain Hydrology Training Course at Davis, California. Mr. Rader has in-depth experience with the technical procedures of WRC Bulletin #17B, HYDRO-35, TP-40 and HMR51. He has been responsible for the coordination and management of 120 flood insurance studies in nine states. Mr. Rader is very experienced in the hydraulic and hydrologic theory on which these programs are based. Mr. Rader has conducted numerous scour analyses and reports involving bridges. Other assignments have included the hydraulic design of flood control structures involving bridges, levees, channels and tainter, bascule and vertical lift gates, erosion control structures, and detention/retention basins.

Mr. Rader has completed river studies on McLoud Run and Walnut Creek in Iowa; Schuylkill River in Pennsylvania; Crow and Dry Creeks in Wyoming; Tongue River in Montana; Columbia River and Latah Creek in Washington; Fox River in Wisconsin; Ottawa River, Big Darby, Flat Branch and Mill Creek, all in Ohio; Turkey Creek in Kansas; Crooked River in Missouri; Red River in Louisiana and the Rio Atrato in Columbia, South America.

His experience includes the hydrologic and hydraulic analysis for reservoir projects in the states of Missouri, Illinois, Kansas, Nebraska, Ohio, Minnesota and Alaska. The various projects involved river and reservoir flood routings, design of pipe and drop box spillways, ogee and morning glory spillways and vegetated emergency spillways, design of rip-rap and St. Anthony Falls stilling basins. Mr. Rader has conducted numerous scour analyses and reports involving bridges.

Mr. Rader has extensive experience in roadway and highway design, particularly the drainage of roadways. He has designed open channel flow systems, enclosed systems and cross roadway drainage structures for all types of roadways including roundabouts. Mr. Rader's roadway experience has also included the development of temporary and permanent erosion control systems for roadway projects. He has been involved with developing traffic control plans and detour layouts. Mr. Rader is knowledgeable of the permitting process for roadway and bridge construction including the requirements for the Army Corps of Engineers and the Department of Natural Resources.

Mr. Rader has recently been involved with hydraulic projects for the cities of Bondurant and Sioux City, Iowa. Mr. Rader has completed Flood Insurance Studies for FEMA in Warren County, Iowa, and the cities of Glendale and

Shell Rock, Iowa. He was also project manager for the Perry County Pumping Stations in Perry County, Missouri. Services included the preparation of the FDM, the hydraulic design of inlet and outlet channels, sizing the pumps, motors and discharge piping, relief wells, levee access ramps, parking lots, preparation of final design plans, specifications, and cost estimates, for four interior flood control pumping stations. Model testing of saxophone discharge piping and rip-rap design was conducted and observed at the Corps of Engineers Waterways Experiment Station at Vicksburg, Mississippi.

He has been responsible for the coordination and management of over 120 flood insurance studies in nine states. Selected Flood Insurance Study Experience:

Cass County, Missouri
City of Elk City, Oklahoma
City of Prague, Oklahoma
City of Cherokee Village, Arkansas
City of Freeman, Missouri
City of Raymore, Missouri
City of Lansing, Kansas
City of Paris, Missouri
City of Solomon, Kansas
City of Beebe, Arkansas
City of Belton, Missouri
City of Altus, Oklahoma
City of Knob Noster, Missouri
Jefferson County, Missouri
City of Peculiar, Missouri
Leavenworth County, Kansas
City of Albany, Missouri
City of Crystal City, Missouri
City of Pevely, Missouri
City of Cherokee, Oklahoma

Philip E. Schrick, PE

Senior Design Engineer
30 years of Experience

Mr. Schrick has been involved in the design and plan production for various structural and civil projects. Responsibilities include the design of roadway and bridge projects and the hydraulic design of bridges and storm drainage. Mr. Schrick has designed over thirty-two federal-aid off-system bridge replacement projects and numerous off-system replacement credit projects in the State of Missouri. His responsibilities have included bridge and roadway surveys, preliminary and final design, hydraulic design of bridge openings, development of vertical and horizontal geometry, plan production, quantity take-offs, contract documents and specifications, right-of-way documents, material testing and construction observations. Additional experience includes bridge inspection, field determination of scour potential and the need for underwater inspection of bridge foundations, and fracture critical analysis of structures. Mr. Schrick has extensive experience in the design of highways and roadways. He has designed horizontal and vertical alignments for high volume divided highways to low volume local rural roads. He has performed a layout and design of a diamond interchange in Greene County, Missouri.

Mr. Schrick's bridge experience has included the hydrologic and hydraulic analyses of bridge waterway openings on roadways for state highway departments, counties and cities. He has performed hydraulic analyses of two bridges for Davis County, Iowa and one for the City of Burlington, Iowa. He has developed preliminary alignments and bridge layouts for the Davis County structures based on the results of the hydraulic analyses. Mr. Schrick has also performed hydraulic studies for eight proposed pedestrian bridges within the 100-year FEMA floodplains in Kansas City, Missouri. From those studies, he prepared "No-Rise" certificates for each bridge for the 100-year Base Flood Elevations (BFE). Mr. Schrick has also designed or developed layouts for the vertical and horizontal alignments of the trail approaches to these bridges for use by the City of Kansas City, Missouri.

Scott M. McDonald, EI

Design Engineer
3 years of Experience

Mr. McDonald has experience in roadway and bridge design, hydraulic modeling of river basins, hydrologic studies of watersheds, 3-dimensional modeling of civil engineering projects and construction observation of roadway and bridge projects and 2-dimensional modeling of rivers and streams. Mr. McDonald has specialized experience in 3-dimensional modeling for highway projects.

Mr. McDonald is experienced in the development of three-dimensional models in Microstation Geopak for transportation projects. He produced a three-dimensional model of a new interchange design near Springfield, Missouri. This model included earthwork and pavement for the bridge approaches and backfill, MSE wall backfill, interchange ramp embankment, and adjacent roadwork for the cross routes intersected including ditch work. The model was useful during development and upon the completion of the model to design and verify superelevations of the roadway, sight distance, turn radii at intersections and calculation of quantities. The model was made available to contractors bidding on the project. The contractor that was awarded the project was then given the option to use the model with an Automated Machine Guidance (AMG) system when constructing the project if he so chose.

Mr. McDonald is currently responsible for the hydraulic modeling of the Perry Creek Flood Protection Improvements project located in Sioux City, Iowa. Design discharges were approved by the Iowa DNR and FEMA. For the analysis the computer software program FESWMS 2DH is being used to create a 2D hydrodynamic computer model for Perry Creek. The hydraulic model is calibrated to observed flows and stage records and highwater marks of actual historic flood events. The model will automatically generate visual time series mapping of flooding extents, depths, velocities and other hydraulic parameters. With the LIDAR mapping he has created GIS layers to show the flood zone and flood boundaries mapped over the topographic and aerial image for the site. Individual layers will be created for the 10, 50, and 100 year events. Results from the hydraulic modeling including GIS mapping will be provided to the City.

Lathrop, Missouri – Facility Plan

Lathrop received a new NPDES permit for their 3 cell lagoon facility in 2014 that added seasonal ammonia and bacteria limits that cannot be met. In addition the City had experienced some permit violations on the BOD_5 and TSS limits likely due to high infiltration and inflow into the collection system. A Facility Plan was developed in May 2015 that presented design criteria as follows:

Five alternatives were developed in detail from mechanical plant options to enhanced lagoon upgrades with the EDI IDEAL system being the recommendation. The IDEAL system converted the third lagoon cell to a hybrid sequencing batch reactor that will give 85% reduction of influent loadings including ammonia-nitrogen. The IDEAL system consists of the Bioreactor Zone, Aerated Polishing Cell and a Non-Aerated Zone followed by disinfection. The graphic below illustrates the proposed facility.

The project costs include a new headworks with grit removal, screening, sampling and flow metering. Other improvements include Peak Process Flow limited to 0.870 mgd (605 gpm) with the two existing primary lagoon cells used for an equalization (EQ) basin. The Bioreactor will have an insulated cover for limiting heat loss by 4x8 insulating panels connected together. The Aerated Polishing Cell will have a cover of loose foam pieces that float on the surface to minimize algae production. Final effluent from the IDEAL system will be disinfected by UV light and discharged to Shoal Creek. Biosolids produced will be stored in an adjacent cell with up to 2 years capacity.

The project includes collection system work for Lathrop as follows:

- New lift station with 6” force main
- New pvc sewer with standard 4’ manholes
- Cured in place pipe lined 8”, 10”, 12” – over 45,000 linear feet
- Manhole rehabilitation
- Removal of three existing lift stations

Lathrop is required to have the new facility online by July 1, 2017 and is currently progressing toward that goal. Total estimated project cost is $6,245,000.

Granger, Iowa – Facility Plan, Design and Construction

In 2010 Veenstra & Kimm, Inc. was retained by the City of Granger to develop a facility plan. Veenstra & Kimm, Inc. has served as the city engineer for Granger since the mid-1960s. Veenstra & Kimm, Inc. designed the original lagoon system for Granger in 1968 and the conversion of the lagoon system to an aerated lagoon system in the mid-1980s. The Granger aerated lagoon system includes two wetland cells that were constructed as part of the 1980s renovations and upgrades.

At the time the treatment lagoons were constructed in the 1980s the City’s population was slightly below 600. The City’s population has doubled to over 1,300 and is continuing to grow. The City anticipates the population of the City will grow to about 3,500 by 2035.

The alternatives evaluated for the City of Granger included lagoon alternatives and mechanical treatment plant alternatives. While the City of Granger preferred the lagoon alternatives the land available for lagoon alternatives was not adequate to accommodate a design population of 3,500. After evaluating all alternatives it was determined the most cost-effective alternative for Granger was to construct a new Sequencing Batch Reactor (SBR) wastewater treatment plant. The new SBR treatment plant is located immediately north of the existing aerated lagoon cells. The aerated lagoon cells are being modified to serve as a wet weather holding pond.

The new headworks includes a spiral fine screen and vortex grit system. Disinfection is by a non-contact ultraviolet light system. Nutrient reduction is an additional benefit of the SBR system which can mimic selector technology with the cycles of treatment.

The total cost for the new mechanical treatment plant for the City of Granger was $5,877,000. By utilizing the existing lagoon cells the City was able to save approximately $1,000,000 compared to alternatives of building a new treatment plant without incorporating the lagoon cells for wet weather flow holding.

Prairie City, Iowa – Wastewater Treatment Facility Plan, Design and Construction

In 2007, Veenstra & Kimm, Inc. was retained by the City of Prairie City to complete an evaluation of its wastewater treatment facility and prepare a Wastewater Facility Plan. The original treatment facility was a two-cell aerated lagoon with chlorine disinfection. However, the effluent disinfection requirement was removed from the City's NPDES operating permit shortly after the facility was built, and the disinfection process was subsequently abandoned.

In 2008, the City of Prairie City was operating under an expired NPDES permit and was anticipating both a new permit with stricter water quality effluent limitations and extensive growth of its community. Veenstra & Kimm, Inc. evaluated four improvement alternatives to accommodate the anticipated effluent limitations and expanded capacity and recommended the construction of a new Sequencing Batch Reactor (SBR) Mechanical Plant.

Veenstra & Kimm, Inc. was subsequently retained by the City of Prairie City to design the recommended improvements for a new SBR wastewater treatment facility. The project included a new bypass structure, a new headworks and blower building with grit removal equipment, a control room and a laboratory, new process tanks with aeration, digestion and sludge storage, a new UV disinfection channel, and a new maintenance building. The existing aerated lagoon cells were converted to be utilized as stormwater equalization basins.

The design population for the City of Prairie City increased from 1,426 to 3,000. The plant was designed for increased Average Dry Weather (ADW) and Average Wet Weather (AWW) flows, and Veenstra & Kimm, Inc. subsequently performed an Antidegradation Analysis for the City that was approved by the IDNR. The plant was designed for a Maximum Wet Weather (MWW) flow of 1.19 mgd and a Peak Hour Wet Weather (PHWW) flow of 2.28 mgd. A construction contract was awarded in March of 2012. Construction began in May of 2012 and was completed in December of 2013.

Garner, Iowa – Wastewater Treatment Facilities Improvements

Veenstra & Kimm, Inc. was retained by the City of Garner to complete an evaluation of its existing wastewater treatment facility and prepare a Wastewater Facility Plan. The original treatment facility was a two-cell aerated lagoon which did not comply with effluent limits per the NPDES permit and was not designed for ammonia nitrogen removal to the degree required by the NPDES permit. Veenstra & Kimm, Inc. evaluated five alternatives and recommended the construction of a new Sequencing Batch Reactor (SBR) Mechanical Plant.

Veenstra & Kimm, Inc. was subsequently retained by the City of Garner to design the recommended improvements for a new SBR wastewater treatment facility. The project included a new lift station and valve pit, new meter pit, headworks and blower building, aeration, digestion and sludge storage tanks. The existing aerated lagoon cells were converted to be utilized as stormwater equalization basins. The headworks improvements included a spiral fine screen and vortex grit removal system. The design population for the City of Garner was 3,500 people. The plant was designed for a Maximum Wet Weather (MWW) flow of 1.66 mgd and a Peak Hourly Wet Weather (PHWW) flow of 2.80 mgd.

Lamoni, Iowa – Wastewater Treatment Facilities Plan of Action
Wastewater Treatment Facility Improvements

The Iowa Department of Natural Resources notified the Lamoni Municipal Utilities to prepare a plan of action to correct past $CBOD_5$ and suspended solids violations from its three cell aerated lagoon system as well as meeting proposed ammonia-nitrogen limitations.

Veenstra & Kimm, Inc. was retained by the Lamoni Municipal Utilities to prepare a plan of action. The plan of action included the preparation of a stream study to determine the actual physical characteristics of the receiving stream and the utilization of IDNR water quality models and water quality standards to develop effluent limitations. Following the development of effluent limitations, improvements were evaluated to meet current and future limitations.

Numerous treatment processes were analyzed for capital, operating and maintenance costs as well as the ability of the selected process to meet both current and potential permit limitations. Of particular concern was possible future nutrient limitations (i.e. total nitrogen and phosphorus). The selected treatment alternative was a sequencing batch reactor.

Lamoni Municipal Utilities has recently requested Veenstra & Kimm, Inc. begin work on upgrading the facilities to be able to treat 1,500 lbs. BOD_5 per day to accommodate a new biodiesel facility to be located in Lamoni. In addition to the facility expansion, the project also includes facilities to allow for the reuse of a large portion of the treated effluent for cooling water at the biodiesel facility.

This Statement of Qualifications is submitted to present the Veenstra & Kimm, Inc. team capabilities and offer a strategy to complete the Engineering Study for the Compton Road WWTP Flood Protection Improvements.

1. Gather Hydrologic and Hydraulic Data
    a. Obtain White River water control plan operation and maintenance manual
    b. Obtain (download) FIS Reports and maps from FEMA map service center
    c. Obtain HEC-RAS model from FEMA Library for White River upstream of Lake Taneycomo
2. Obtain Data from the City
    a. Aerial Photography
    b. Two foot topographic data
    c. Existing soil borings at site
    d. Existing plans of plant facilities supported on piers to bedrock
    e. High water elevation locations in vicinity of and at project site with date of occurrence to correlate with discharges from Table Rock Lake
    f. Existing Plans for influent pump station protected from the FEMA 100 yr. Elevation
3. Review all data gathered and discuss with Little Rock District and Southwest Division of Corps of Engineers the final operation control plan for Table Rock Dam.
4. Schedule meeting with the City of Branson Engineering Department to inform them of our findings.
    a. Determine the scope of services for a geotechnical firm.
    b. Discuss interim flood protection measures – sand bags, stop logs, temporary concrete barriers and local availability of materials.
    c. Schedule field survey to locate existing facilities, gravity outlets, as well as determine levee and roadway elevations.
    d. Location of any above and below ground tanks and associated anchor/hold-down devices.
5. Geotechnical subsurface investigation and recommendation
    a. Evaluate groundwater transmissibility.
    b. Subsurface seepage
    c. Options for seepage control ie: piles, horizontal drilling, grouting and centralized detention with pumping.
    d. Soil borings for Compton Drive in area to be raised.
6. Feasible flood protection alternatives
    a. Raised earthen levee – Plant Only
    b. Raised earthen levee and raise Compton Drive – Plant Only
    c. Raised earthen levee protecting all facilities
    d. Concrete floodwall added to existing earthen levee – Plant Only
    e. Concrete floodwall added to existing earthen levee and raise Compton Drive – Plant Only
    f. Concrete floodwall added to existing earthen levee protecting all facilities
    g. Others
7. Hydraulic analysis (HEC-RAS) & Two-dimensional modeling (FESWMS &/or TUFLOW)
    a. Determine water surface elevation with HEC-RAS model from FEMA Library
    b. Analyze the six scenarios listed above and others if agreed upon
    c. Two-dimensional hydraulic modeling
    d. Two-dimensional modeling allows time dependent flooding using computer graphics
8. Determine preliminary quantities and cost estimates for each scenario
9. Determine impact of improvements on adjacent and upstream properties
10. Schedule meeting with the City of Branson Engineering Department to inform them of our findings.
    a. Recommend flood protection design criteria.
    b. Determine path to move forward/recommendations.

11. Evaluate effluent pump capacity at maximum flood elevation based on recommended flood protection design criteria
12. Evaluate groundwater removal system permanent pumping arrangement or portable system based on economic analysis
13. Address need for subsurface seepage control based on Geotechnical report recommendations
14. Evaluate groundwater check valve operation in plant facilities during and after design flood event
15. Finalize all economic analysis using value engineering procedures
16. Develop possible funding sources and prepare applicable funding applications
17. In the event the base flood elevations are increased and or the regulatory floodway is affected, FEMA requires a LOMR be prepared and submitted using form MT-2. Veenstra & Kimm, Inc. would prepare the application for the City. This action would necessitate the need for Public Notices regarding increasing flood levels and floodway revisions.
18. Draft Report to the City of Branson
19. Final Report to the City of Branson

In the forefront of the design team's approach will be the use of established and innovative design methods and technologies while keeping in mind the importance of economical and efficient construction methods to minimize project costs and the time needed for construction. An out of the box approach to any engineering project is of the utmost importance so the problems and concerns of the proposed project are determined and corrected.

Engineering Study Approach and Schedule

	Task	Duration	Completion
1.	Gather Hydrologic and Hydraulic Data	4 Weeks	4 Weeks
2.	Obtain Data from the City	3 Weeks	7 Weeks
3.	Review all Gathered Data	4 Weeks	11 Weeks
4.	Meeting With the City of Branson Engineering Department	2 Weeks	13 Weeks
5.	Geotechnical Investigation	5 Weeks	18 Weeks
6.	Feasible Flood Protection Alternatives	4 Weeks	22 Weeks
7.	Hydraulic Analysis	8 Weeks	30 Weeks
8.	Preliminary Quantities and Cost Estimates	4 Weeks	34 Weeks
9.	Determine Impact to Surrounding Area	4 Weeks	38 Weeks
10.	Meeting With the City of Branson Engineering Department	2 Weeks	40 Weeks
11.	Evaluate Effluent Pump Capacity at Max Flood Elevation	2 Weeks	42 Weeks
12.	Evaluate Groundwater Removal System	5 Weeks	47 Weeks
13.	Address Need for Subsurface Seepage Control	4 Weeks	51 Weeks
14.	Evaluate Groundwater Check Valve Operation	4 Weeks	55 Weeks
15.	Finalize all Economic Analysis	4 Weeks	59 Weeks
16.	Develop Possible Funding Sources and Applications	5 Weeks	64 Weeks
17.	Preparation of a LOMR and Form MT-2 if Required	3 Weeks	67 Weeks
18.	Draft Report to the City of Branson	4 Weeks	71 Weeks
19.	Final Report to the City of Branson	3 Weeks	74 Weeks

Throughout the entire 18 month schedule shown above, Veenstra & Kimm, Inc. will provide the City of Branson with monthly summary reports of progress and findings. We will be able to meet with City Staff at any time when requested and will attend all public hearings and open house meetings that are schedule by the City. V&K realizes the need for complete transparency for this type of project in order to keep all stakeholders and interested parties informed and in the project's lines of communication.

The capacity of the firm is illustrated below in the table showing staff "availability" for the project. The capability is also illustrated below in "experience" of staff.

Staff	Experience (Years)	Availability	Location of Performing Work	Role
V&K:				
Dave McDonald, P.E.	41	15%	Liberty, MO	Principal, Technical Advisor, QA/QC, Administration
Roger Waltemath, P.E.	37	30%	Liberty, MO	Project Manager, Planning, Process, Design
Leroy Rader, P.E.	53	40%	Liberty, MO	Project Engineer, Planning, Process, Hydraulics, Sewer Rehab
Phil Schrick, P.E.	30	15%	Liberty, MO	Roadway Design, Sewer Rehab
Scott McDonald, E.I.	3	25%	Liberty, MO	Sewer Rehab, 2-D Hydraulic Modeling
Bob Morrison	42	20%	Liberty, MO	CAD Layout

The following staff members with their areas of expertise and experience will be used throughout the development of this engineering study.

H. R. (Bob) Veenstra Jr., P.E., President – West Des Moines, Iowa Office
Veenstra has been with Veenstra & Kimm, Inc. since 1976 and brings a wide range of experience in project management of municipal, utility and infrastructure projects along with a background in municipal utility and comprehensive planning.

Mark Seip, P.E. – Liberty, Missouri Office
Mark has more than 30 years experience in municipal work including headworks, pump stations, and plant work featuring wastewater treatment processes and nutrient control. A professional engineer, he is licensed in Missouri and is also a licensed wastewater treatment plant operator. As such, he brings an aptitude and appreciation for the operating and maintenance needs of the facility including staff requirements.

Forrest Aldrich, P.E – West Des Moines, Iowa Office
Aldrich has been with Veenstra & Kimm, Inc. since 1987 and brings a wide range of experience working with cities on municipal engineering. Aldrich brings a unique blend of municipal engineering skills along with experience in the area of water and wastewater treatment.

Leo Foley, P.E. – Moline, Illinois Office
Foley has been with Veenstra & Kimm, Inc. since 2000 and currently serves as manager of Veenstra & Kimm, Inc.'s Moline, Illinois office. Foley's expertise is in the area of municipal infrastructure, including flood protection and flood management improvements.

Tony Bellizzi, P.E. – West Des Moines, Iowa Office
Bellizzi has been with Veenstra & Kimm, Inc. since 1989. Bellizzi provides a wide range of municipal engineering services with a focus on municipal street assessment and rehabilitation programs.

R. Ted Payseur, Vice President – West Des Moines, Iowa Office
Payseur has been with Veenstra & Kimm, Inc. since 1972 and works extensively in the area of municipal utility planning and finance. Payseur has been actively involved with communities in developing and implementing long range plans for combined sewer separation and sanitary sewer rehabilitation.

TIMELY PERFORMANCE

The project team members for the project were chosen based on their availability and expertise. Veenstra & Kimm, Inc. understands the importance of the project staying on schedule. The schedule is important from the initial study through the design and construction of the project. The element of the project schedule most directly under the control of the engineer is the study and design phase. Veenstra & Kimm, Inc. maintains an internal schedule updated on a regular basis to allocate staff resources.

Veenstra & Kimm, Inc. makes the commitment to any project to provide the necessary personnel for the project team to ensure the work is completed within the project schedule. We believe it is our responsibility to undertake those steps necessary to complete work within the established schedule. We understand this is particularly important for projects with outside funding, such as the SRF, CDBG and other programs, where the project schedules are established as a part of the grant and loan agreements.

Veenstra & Kimm, Inc. believes the project budgets and schedules are best addressed by the key project management personnel. The role of the project manager is to ensure the client's needs and objectives are being addressed in a timely manner. We believe key project managers are more acutely aware of cost considerations. For example, the project manager who also has responsibilities for business management within the company understands the value of time and the importance of limited resources. This perspective is combined with the technical perspective of the design to result in a high quality product completed on time and within budgetary limitations.

QUALITY CONTROL/ASSURANCE

Veenstra & Kimm, Inc. understands the importance of quality control through planning, design and construction of all our improvement projects for our clients and their patrons. Veenstra & Kimm, Inc. understands quality assurance and quality control (QA/QC) requires a combination of commitment by all members of the project team as well as a formal oversight structure to provide an independent review. V&K utilizes an internal QA/QC program on all major projects. Our QA/QC plan was developed to adapt the classical independent QA/QC concept within the context of our firm.

Veenstra & Kimm, Inc.'s QA/QC program is based on two major elements. The first element of our QA/QC plan is our approach to planning and design. Veenstra & Kimm, Inc.'s business model is based on our most experienced and qualified staff members being actively involved in all aspects of project planning, design and construction. Our proposed project team involves a majority of experienced staff members; the most active members of the project team are the senior staff members with the greatest experience. This approach is the reverse of many firms in which junior staff members are primarily responsible for the day to day activities with oversight provided by senior personnel. Our project team is able to avoid many of the quality issues that arise when less experienced staff members are responsible.

The second element of our QA/QC plan involves an internal review of planning and design documents at the 50% and 90% completion levels. The QA/QC review is undertaken by senior staff members with experience in the type of work they are reviewing. The reviewers are staff members not actively involved in the project team. The QA/QC review is intended to provide an independent objective review. **We also include the client in the review as a workshop type setting to obtain your input in the project.**

The QA/QC review at the 50% level focuses on the conceptual level. This review is intended to ensure the concepts are sound and cost-effective and initial details are consistent with that intent. The 90% QA/QC review focuses on specific details being recommended in the study or design. **This also allows the client to input any preferences on equipment and other construction details.**

The QA/QC review concept is adapted to the specific work product being reviewed. For example, for a facility plan, the QA/QC review focuses on concepts, implementation issues and cost estimating. For a design project the QA/QC review focuses on the potential for internal conflicts within the design, the constructability of the improvements, cost estimating and bid-ability. The program is seamlessly integrated with our work in a manner that provides the appropriate quality assurance in a timely manner. We are flexible in how our clients interact with our quality assurance and review. Some clients prefer to be actively involved in the QA/QC review. Other clients leave the

QA/QC review as an internal procedure. **If a client wishes to be engaged in the QA/QC process the program is adjusted to allow that participatory role as mentioned above in a workshop type setting with the design team.**

BUDGET CONSTRAINTS

Veenstra & Kimm, Inc. provides its own cost estimating based on our experience with similar projects and evaluation of the cost of similar projects undertaken by others. Veenstra & Kimm, Inc.'s cost estimating is undertaken by our most senior project managers based on personal experience, firm experience and available data on similar projects.

In developing cost estimates, Veenstra & Kimm, Inc.'s goal is to estimate projects slightly above what we believe is the likely cost of the project. We utilize this approach because one of the most difficult challenges for a Client is to address an unexpected overrun in project cost either during the bidding phase of the project or the construction phase of the project.

From Veenstra & Kimm, Inc.'s perspective there are two elements of estimating accuracy. The first element is the relationship between the cost estimate in the engineering report, the engineer's estimate of cost at the completion of design and the initial contract amount. At the engineer's estimate stage at the completion of the design, our target would be to estimate the cost about 5% above what we believe to be the likely low bidder.

A second element of cost estimating and project budgets relates to unforeseen costs that occur during construction. Veenstra & Kimm, Inc. strives to minimize any cost increases that occur during the construction of a project.

CITY	PROJECT DESCRIPTION	ENGINEERS ESTIMATE	BID RESULTS	CHANGE ORDERS	COMPLETION DATE	COMMENTS
Winterset	UV Disinfection, Site Lift Station, Trickling Filter Upgrade	$1.75 M (Alternates)	$1.863 M	3.01%	7/20/2016	Alternates not accepted
West Liberty	UV Disinfection, Sludge Dewatering, Misc.	$3.0 M (4 Alternates)	$3.063 M	TBD	2/1/2017	Alternates accepted
Davenport	Pumping, Screening, Rehab of Aeration Systems, Gates, Clarifiers and New RAS, WAS Pumps	$8.0 M	$7.3 M	TBD	7/1/2017	$400,000 contingency fund included in Contractor bid
Granger	New Site Lift Station, SBR, UV Disinfection, EQ Basins, Digester	$5.4 M	$5.87 M	0.3%	3/1/2016	Alternate UV not accepted
Prairie City	New Headworks, SBR, Sludge Storage, UV Disinfection, EQ Basins, Maintenance Building	$4.0 M	$4.02 M	0.5%	8/1/2013	Final construction cost was $4.04 M
Keokuk	Renovation, Expansion of Lab and Administration Building, Upgrade of Electrical Supply Control Center, Structural Improvements to Primary and Secondary Clarifiers. Replace 3 Lift Pumps, Addition of UV Disinfection prior to Final Effluent	$4.6 M	$4.597 M	2.0%	6/7/2016	Upgrade for new power transformers - change order
Garner	New Headworks, SBR, Site Lift Station, Sludge Storage, EQ Basin, UV Disinfection	$3.125 M	$3.349 M	4.8%	7/1/2011	Final construction cost was $3.51 M

This element of cost control is directly interrelated with the quality of the design as well as our quality assurance and quality control program. Veenstra & Kimm, Inc. strives to maintain changes that occur during construction of a project to the range of not greater than approximately 3%.

Our project history shows that we consistently complete projects on time and under budget.

Project #	Project Name	Type/Phase	Budget	Contract Amt.	Contract Amt. to Date	% Complete	Contractor Arch/Eng	Total Change Order Amt	% change	Notice to Proceed	Anticipated Completion	Comments
UTILITIES												
SW1006	CCWWTP Interim Improvements	Design	$300,000.00	$238,500.00		0%	Black & Veatch			4/11/2016	12/31/2016	Kick Off Meeting 4/11/16
SW1206	Branson North Water Line (12") Phase 1	Design	$303,000.00	$85,540.00	$78,245.00	91%	Rozell			9/5/2013	8/1/2016	Ph. 2 Water Line Final Plans approved by DNR
							Contract amendment for survey $2,550		Cont. Amend $20,000 for Design Ph. 2			
SW1206	Branson North Water Line (12") Phase 1	Construction	$1,000,000.00	$1,020,894.00	$503,403.36	49%	Flat Creek Excavating			11/2/2015	3/31/2016	In progress
	Branson North Water Line (12") Phase 2	Construction	$350,000.00									
WS1401	Lift Sta. 21 Equalization Basin	Construction	$1,200,000.00	$1,320,289.00	$73,578.60	6%	Davis Structures			2/10/2016	10/15/2016	In progress
SW1202	Animal Safari Sewer	Construction	$496,000.00									Open bids 4/8/16
BUILDINGS												
PR1602	RecPlex Carpet Replacement	Construction	$28,000.00	$28,000.00			Stoneridge Flooring			1/26/2016	6/26/2016	In progress
TRANSPORTATION												
EN1301	Hwy 76 Complete Street	Design/Master Plan	$3,000,000.00	$2,293,873.52	$2,284,782.95	100%	Cook Flatt & Strobel			12/6/2012	12/31/2014	Concepts and Financing under review
							Contract Amend No. 1 - 697668.52					
		Phase 1 Design	$5,400,000.00	$5,268,217.00	$3,741,768.09	71%						Phase 1a water line bids open 4/21/16
							Contract Amend No. 3 - 65,510 (Marketing)					
EN1201	Downtown Reconst. & Landscape	Construction Ph. 1		$2,563,446.00	$1,709,962.00	67%	D&E Plumbing			10/15/2014	6/1/2015	Liquidated damages in effect 6/1/15 - totaling $115,500 as 3/1/16
		Design Ph. 2		$588,578.90	$532,912.36	91%	CMT			12/19/2014		Design complete
							Cont. Amend No. 5 - 148,980					
		Construction Ph. 2										Bids open 4/21/16
		Up the Hill		$257,696.00	$174,725.86	68%	CMT			1/21/2015		In progress
		Design Ph. 3		$337,900.00			Great River Eng			4/13/2016		Final reading of agreement 4/12/16
EN1601	Forsyth & Roark Traffic Signal Imp.	Construction	$85,000.00	$52,000.00			Mid-American Signal					Contract to council for approval 4/26/16
MISCELLANEOUS												
EN1203	Fuel System & Fuel Tank Replace	Construction	$170,000.00	$204,910.50	$174,920.64		Broyles			6/17/2013	2/13/2014	Construction Complete. Holding retainage.
							Change Order No. 1 Risk Assessment $62,216.50					
EN1508/FR	Roof Replacement City Hall & Fire #3	Construction	$58,000.00	$78,084.00			Cook Roofing					Preconstruction meeting 4/12/16
PR1601	Campground Wireless Internet Upgrade	Construction	$20,000.00	$18,408.76	$9,204.38	50%	Tengo Internet			3/23/2016	6/1/2016	In progress

Upcoming 2016 Projects

Fire Sta. #1 Roof	30,000	Traffic Signal Upgrade Gretna & Roark	53000
Tennis Court Imp. Ph. 2	48000	Branson Hills Parkway Sidewalk Imp.	60000
Trail Improvements	65000	Water Main Const. Branson Hills North Ph. 2	350000

City of Branson

FINAL CHANGE ORDER

Project Name John Nygard Retaining Wall Project No. C2015-0243

Contractor Prolawn & Landscape

The below noted modifications to subject Contract are directed by Owner and accepted by Contractor:

Additional work to dig out 12" – 18" of road to allow new retaining wall to be constructed in front of the existing wall for drainage purposes. $2,700

The modifications noted above result in an increase of $2,700.00 in Contract Price, the current Contract Price being:

Original Contract Price	$	29,700.00
Total net amount of all previous Change Orders	$	27,000.00
Total net amount of all previous variable quantity adjustments	$	0
Total net amount of this Change Order	$	0
Current Contract Price Including this Change Order	$	2,700.00
	$	29,700.00

The Contract Time shall be unchanged. The current completion date being: July 31, 2016

Original Completion Date		July 31, 2016
Total net time adjustment of all previous Change Orders	(+ or -)	0 days
Total net time adjustment of this Change Order	(+ or -)	0 days
Current Completion Date including this Change Order	(+ or -)	July 31, 2016

The price and/or time extension set forth in this Change Order is full compensation for all costs and delays, direct and indirect, incurred in connection with the conditions giving rise to this Change Order, the work specified herein, and any consequential costs, delays or effects on unchanged work resulting therefrom.

This Change Order, when executed, constitutes a modification to the Contract and all provisions of the Contract, except as modified above and by any previous Change Orders, shall apply hereto.

OWNER – City of Branson

By _____
William J. Maliner, City Administrator

Date 2/29/16

Prolawn & Landscape

By _____

Date 2/29/16

Approved as to Form:

2-3-16

William T. Duston, City Attorney