February 3, 2018

Mr. Alex Damien
City of Waukesha
201 Delafield Street
Waukesha, WI 53188

Re: City of Waukesha
Woodfield Dam Removal

Dear Mr. Damien:

Thank you for the opportunity to submit this proposal for professional services for removal of the Woodfield Dam. This letter presents our proposed scope of services, time schedule, and fee.

Ayres Project Team and Experience

Ayres Associates' Water Resources Group specializes in rehabilitation and removal of dams. We are partnering on this project with Stony Point Hydrology, LLC. Mike Schwar from Stony Point is experienced with the City of Waukesha stormwater modeling and in 2017 completed a feasibility study for the removal/repair of the Woodfield Dam.

Attached are resumes for Chris Goodwin, Pete Haug, and Blake Theisen. Chris and Pete have experience working with several dam owners to design, permit, apply for grants, and administer construction for several successful dam removals. Blake is a leader in Ayres Associates landscape architecture and will assist the team in evaluating the park impacts and trail design. We also have wetland specialists and ecologists on staff who can assist in evaluating wetland impacts, stream restoration, and possible phosphorus removal options.

The team we have assembled to assist the City with this project has extensive experience in dam removal, dam design, stream restoration, wetlands, ecological impacts, and storm water quality and quantity modeling. Mike Schwar brings a consistency to the team, tying the previous dam removal studies to this current work.

Project Description

The Woodfield Dam is an unauthorized structure within the City of Waukesha. The WDNR is requiring the City to either submit plans to rehabilitate the dam to meet current WDNR standards, or to submit plans to remove the dam.

N17 W24222 Riverwood Drive, Suite 310 ● Waukesha, WI 53188-1132
262.523.4488 ● Fax: 262.523.4477 ● www.AyresAssociates.com

The impoundment is used for recreational purposes and is within the City's park system. Previous studies by Patrick Engineering and Stony Point Hydrology have outlined options and provided opinions of cost to either repair the dam or remove the dam. The dam is also possibly incorporated into the City's current stormwater quality modeling and credited with some total suspended solids removal. In project scoping meetings with WDNR staff, it is likely that the Woodfield Pond should not be included in the City's water quality models as a water quality feature.

The current embankment and structure serves as part of a City Park trail around the impoundment. Maintaining this access for City residents is a necessary component of the project.

Scope of Services

1. Project Scoping Meeting – Meet with Waukesha City staff to review project scope, schedule, and deliverables. Meeting can either be on site or at City office
2. Obtain, as appropriate, for this project existing stormwater quantity and quality models for Woodfield Pond. We will review these models and use them to support additional models developed for the dam removal design.
3. Dredging and dam removal projects require a sediment sampling plan be submitted and approved by the WDNR following the requirements of NR347. We will contact WDNR staff prior to preparing sediment sampling plan, draft the plan, and submit to WDNR for approval.
4. Survey and Sediment Sampling – We will complete a through ice survey of pond to measure depth to and depth of sediment in two or three cross sections. Final number of cross sections and probes will be based on field observations. Sufficient pond bottom probes will be collected to determine the physical characteristics and depth of sediment deposited above the natural lake bed, locate if possible the natural stream channel, and collect at least one sediment sample for chemical and physical characterization. Because cost of sediment analysis will be dependent on the number and parameters required by WDNR, we have included these costs as a separate line item in our proposal. Final cost will be dependent on WDNR approval of sediment sampling plan.
5. Our proposal includes a contingency of $2,500 for additional geotechnical sampling that could be required for the projects. This could include soil borings in the embankment or additional sediment sampling in the impoundment.
6. Topographic Design Survey – The City has some survey information available of the Woodfield dam and downstream roadways and culverts. We will review this data and determine if additional survey is needed to develop our design and hydraulic models. For cost estimating purposes, we have included one day of field survey to gather necessary information. If this is not needed, it can be deleted from the scope of services and fee.
7. We will use the hydrology output from the City's existing xpswmm model to develop hydraulic models to be used in design of the dam removal. The City is currently designing storm sewer improvements that will convey storm water from a sub-basin between Waukesha Memorial Hospital and S. Moreland Blvd. to Woodfield Park, increasing the peak discharge to dam impoundment, and to the restored stream, in the future. The increased flows will be used for the project design. We collect this flow data from the xpswmm model by either reading it from the model output or re-running the model to generate this output.
8. We will use HEC RAS to map the pre- and post-dam HEC-RAS 100-year flood limits and to show the impacts of removing the dam.

9. Culverts crossing under the park entrance and St. Paul Street will be modeled to in either HEC RAS or HY8 for sizing. If culverts are undersized for flow, we will provide recommended sizing. Our proposal does not include final design of larger culverts.
10. Build a water quality model of existing Woodfield pond using SLAMM. The purpose of this model is to determine the water quality improvements realized by existing pond. The results of the model will be used to evaluate water quality alternatives to be considered in the upland areas upstream of the existing pond.
11. Evaluate up to three water quality improvement best management practices to be constructed in the watershed to replace the water quality enhancement currently created by the existing Woodfield pond. We will develop the three alternatives, estimate their efficiencies and associated costs, and review these with WDNR. These will be prepared before completion of the existing pond SLAMM model. We will assist the City in preparing a Storm Water Management Grant from the WDNR for funding of the selected alternative.
12. The City is currently not required to meet or pay for phosphorus loading. In the future when this is required the City may be able to trade nutrient removal from stormwater quality BMPs in Woodfield Park for other discharges in the City. In our water quality modeling and design of the dam removal/channel restoration, we will evaluate water quality features, such as constructed wetlands and overflow areas or pool and riffle areas that may be used for subsequent nutrient trading as an overall benefit to the City.
13. Lowering the water level in Woodfield pond by removing the dam may alter the hydrology of wetlands near the pond. We will review the past wetland delineations provide an assessment of the overall anticipated impacts of removing the dam.
14. Develop 30% dam removal plans – We will prepare 30% plans based on data gather in the above tasks. Plans, based on information available at this time, will include
    a. Dam breach and channel restoration at dam
    b. Existing sediment depths in pond
    c. Assessment of capacity of downstream culverts, one under park access road and culverts under West St. Paul Avenue
    d. Any required stream bank stabilization for channel downstream of removed dam
    e. Potential public fishing improvements to the restored stream channel
    f. Channel restoration upstream of dam including beyond the limits of the existing pond
    g. Removal/modifications of existing upstream stop log structure
    h. Alternative routes for walking path around pond
    i. Erosion control, grading, dewatering, sediment disposal if needed, site restoration, landscaping plan, and typical construction details
    j. Develop a table of contents of anticipated technical specifications needed for project bidding
15. Meet with City staff to review the 30% design
16. Contact WDNR staff and review 30% design plans with WDNR staff
17. Based on comments and input from City staff, develop 90% plans for dam removal and restoration. Develop technical specifications needed for bidding the dam removal and restoration project.
18. Meet with City Staff to review 90% design
19. Based on comments and input from City staff, final 100% plans and specifications for dam removal and restoration.
20. Participate in one Public Information meeting
21. Assist the City in applying for a Municipal Dam Grant for funding of the dam removal project

22. Assist the City in applying for State, Federal, and local permits for the dam removal and restoration.

Responsibilities of Owner and Others

The City will provide access to appropriate available data such as surveys and hydraulic models to assist in development of the dam removal plan. The City will also provide the meeting location for the Public Information Meeting. The City will prepare necessary resolutions and ownership information necessary for grant applications.

Time Schedule

Task	Date of Completion
Notice to Proceed	January 24, 2018
Obtain Existing Information from the City	January 26, 2018
Review Water Quality Alternative with WDNR	January 31, 2018
Submit Sediment Sampling Plan to WDNR	January 25, 2018
Survey and Sediment Sampling	February 2, 2018
Submit 30% Plans Provided to City	February 14, 2018
Review 30% Plans with City	February 15, 2018
Submit 90% Plans to City	February 21, 2018
Review 90% Plans with City	February 22, 2018
Prepare 100% Plans and Specifications	March 5, 2018
Participate in Public Information Meeting	TBD
Prepare Stormwater Management Grant	April 16, 2018
Prepare Municipal Dam Grant	April 23, 2018
Apply for State, Federal and Local Permits	Schedule dependent on grant award

Fee

We will perform the above services for an amount based on a standard hourly rate provided to the City of Waukesha for each class of employee, plus reimbursable expenses and subconsultant charges. The estimated cost of services is broken down as follows:

Dam Removal Design	$33,600
Stormwater Alternatives	$5,400
Sediment Analytical Costs (Estimate)	$500
Grant Applications	$2,000
Total	**$41,500**
Additional Survey if required	$1,400
Additional Geotechnical	$2,500

Sincerely,

Ayres Associates Inc

Michael Payant, PE
Manager - Engineering Services
Direct: 262.522.4915
Cell: 262.903.4053
PayantM@AyresAssociates.com

Chris Goodwin, PE
Manager - Water Resources
Direct: 715.831.7682
Cell: 715.829.6941
GoodwinC@AyresAssociates.com

CG:kf

Enclosure