



TOWN *of* WAKE FOREST

REQUEST FOR QUALIFICATIONS

Project: Flaherty Park Dam Improvements
Project Manager: Holly Miller, PE, CPESC, CFM, Assistant Town Engineer
Phone Number: 919.435.9443
Date of Advertisement: Wednesday, September 21, 2016
Qualifications Due Date: Wednesday, October 19, 2016 @ 2:00 p.m.

The Town of Wake Forest (Wake Forest) invites qualified private engineering firms (PEF) to submit Letters of Interest (LOI) to provide redesign of Flaherty Park Dam, Pond 1, located at 1226 North White Street, Wake Forest, NC 27587.

I. BACKGROUND

The Town of Wake Forest conducted a Structural and Dam Inventory in 2014 for its parks and greenway facilities. Flaherty Park Dam was identified in need of minor & major repair due to tree growth and erosion on backside of spillway slope. There is a wet location with seepage at the toe of slope that is of concern and warrants additional investigation and possible rebuild of dam. If left unchecked the seepage, emergency spillway configuration and lack of drawdown device could create a failure and potential loss of pond. The emergency spillway will need to be re-established along with a draw down device and/or syphon, along with potential soil added to the fill to lessen the slope of the embankment. The project will require design, H&H, geotechnical evaluation, and permitting. Construction will be conducted in the subsequent year, pending budget approval or grant award opportunities.

II. DESCRIPTION OF SERVICES

The selected firm will report directly to the Town of Wake Forest. The selected firm is to administer the contract and ensure that all work is performed in accordance with the contract requirements. The PEF will be responsible for providing engineers, designers, geotechnical investigation within the appropriate skills and qualifications to ensure contract compliance. The PEF will be directly responsible for oversight of the project for the Town. The PEF shall indemnify and save harmless the Town for claims and liabilities resulting from negligence, errors or omissions of the PEF; including, but not limited to, the engineers, technicians, architects or sub consultants.

Any firm wishing to be considered must be properly registered with the Office of the Secretary of State and with the North Carolina Board of Professional Engineers, Professional Landscape Architects and Land

Surveyors. Any proposed corporate subsidiaries or subcontractors must also be properly registered with the appropriate NC Board of Registration for their role in the project. The Engineers or Landscape Architects performing the work and in responsible charge of the work must be registered Professional Engineers in the State of North Carolina and must have a good ethical and professional standing. It will be the responsibility of the selected private firm to verify the registration of any corporate subsidiary or subcontractor. The firm and subconsultants shall not discriminate on the basis of race, religion, color, national origin, age, disability or sex in the performance of any contract entered into under this pre-qualification process.

The firm must have the financial ability to undertake the work and assume the liability. The selected firm(s) will be required to furnish proof of Professional Liability insurance coverage in the minimum amount of \$1,000,000. The firm(s) must have an adequate accounting system to identify costs chargeable to the project. The proposed method of payment for these contracts will be LUMP SUM or Cost-Plus. Payment type will be determined after the scope of work is defined for each project.

The selection of a PEF to provide the desired services on this specific project will be handled in accordance with the following process:

- A. Submission of a Letter of Interest (LOI) by private engineering firms.
- B. The Town anticipates selection of PEFs based on the LOI.
- C. The Town reserves the option to create a short list of firms and conduct oral interviews.
- D. The Town will contract with one or more PEFs

III. SELECTION PROCESS

Pursuant to North Carolina General Statute 143-64.31, the Town of Wake Forest utilizes a “qualifications-based” selection process without consideration of fee proposals in the initial stage for selecting consultants. The selection process and schedule will be as follows:

A. Advertisement: An advertisement for the RFQ will be posted on the following websites:

- 1. http://www.wakeforestnc.gov/residents-finance_purchasing_bidsandannouncements.aspx
- 2. <https://connect.ncdot.gov/letting/Pages/Private-Engineering-Firm-Advertisements-.aspx>

B. Qualifications Submittal: Written submittals must be received by the Town Engineering Department no later than **2:00pm, Wednesday, October 19, 2016**. Submittals received after this deadline will not be considered.

C. Submittal Material: Consultants interested in providing services as described in this RFQ shall submit five (5) originals and one (1) digital copy in a PDF format of the submittal in a sealed container/envelope labeled on the outside; LOI for **“Flaherty Dam Park Improvements,”** along with the firm name. Send or hand-deliver submittals to:

**Town of Wake Forest
Engineering Department
Attn: Holly E. Miller, Assistant Town Engineer
301 S. Brooks Street
Wake Forest, NC 27587-7387**

Completed qualification packages must be received at the address above by **2:00 p.m. on October 19, 2016**. **Qualification packages containing more than the requested number of pages (20 pages (front and back equals 2 pages, minimum font size of 11)) will not be considered.** Sub-tabs or dividers are acceptable and do not count toward the page limit. Firms submitting qualifications packages are encouraged to carefully check them for conformance to the submission requirements or if they are delivered to any other office other than the Town of Wake Forest Engineering Department, they will be disqualified. **No exception granted.**

D. Award: The Town will establish a shortlist of a minimum of three firms; the exact number will be

determined depending on the quality, diversity and responsiveness of the proposals received.

The short-listed firms will be notified by **email**. Notification **will not** be sent to firms' not-short listed. At the option of the Town, oral interviews with the short-listed firms will be conducted. In the event the Town elects to hold oral interviews, they will be held at Wake Forest Town Hall (301 S. Brooks Street, Wake Forest, NC 27587). The Town of Wake Forest reserves the right to reject any or all RFQ's and to make the award as deemed in the best interest of the Town of Wake Forest.

E. Notification: Official notification of firm selection shall be announced once the Town has reviewed the preferred firm and authorized the Town's selection of said firm. The firm selected will be notified by phone and email. Email notification will be sent to firms not selected. The Town reserves the right to reject any and all Letters of Interest.

F. Board Approval: Staff will request Wake Forest Board of Commissioner approval to negotiate with the recommended firms in priority order.

G. Contract Agreements: Contract agreements with the selected firm will be negotiated and executed immediately after selection. If negotiations are unsuccessful with the first firm selected, a second firm will be selected and negotiations initiated.

***All firms submitting LOIs are expected – if selected – to prepare a scope of services, fee estimate (with personnel rate schedule), and any other required documentation in a timely manner. Failure to provide timely response will result in termination of the negotiation process.**

IV. QUALIFICATION SUBMISSION REQUIREMENTS

A firm interested in submitting a Flaherty Park Dam Improvements proposal must address the firm's qualification and expertise in the aforementioned general services. This qualification packet shall be submitted on 8 1/2" x 11" paper, side bound with Table of Contents and reference tabs for key sections. The packet submitted shall not exceed twenty (20) pages double-sided (front/back covers, Table of Contents, RS-2 forms, and tab pages are excluded from these totals). Complete responses to each of the following categories are required:

A. Cover Letter

The Letter of Interest (LOI) must be addressed to Holly Miller, Assistant Town Engineer. Said letter is limited to one (1) page and should contain the following elements of information:

1. Expression of firm's interest and why you feel your firm would be best suited for this project;
3. Statement regarding firms' possible conflict(s) of interest for the work; and
4. Identification of the Project Manager and their contact information.

B. Organization of Consultant Team

1. Team Organization Chart showing all firms, contractual relationship between firms, and names of specific staff proposed for this project, including their titles. Also, include other information you feel is appropriate for field surveying, H&H, geotechnical and other subcontract work.
2. Responsibilities to be fulfilled by each team member assigned to the Project. The description of responsibilities shall include an estimated percentage of the total project that is to be completed by each individual team member.
3. Indicate how the work described in this RFQ will fit into the total workload of the firm.
4. Detailed resumes for key staff.
5. Names, classifications, and location(s) of the firms' North Carolina employees and resources to be assigned to the advertised work.

C. Qualifications/Experience

1. Provide a description of the qualifications and experience of the key individuals who will be actively involved in the work (including registration numbers of engineers, planners, etc.). Include the office location in which each key individual is located.

2. Clearly identify each key individual's experience with similar type projects, the specific role that individual performed, and the firm they were employed by at the time of the project work.
3. Previous experience and examples of similar projects designed and/or a construction project managed by the office where the work was performed, giving the name of the client and brief description of the project, dates work was started and completed, construction cost, special design considerations, etc. Please also include a current contact person with a phone number for each project. Limit projects to those completed in the last five years. Do not include projects on which members of the applicant firm worked on while employed by another firm.

D. Similar Project Experience (Graphics & Narrative)

Provide a summary and pictures of at least three (3) projects of similar scope for which the Consultant was primarily responsible within the last five (5) years. Each of the project summaries shall include the following:

1. Description of the project including size and scope.
2. Description of services rendered by the Consultant.
3. Degree of involvement (prime consultant or sub consultant).
4. Associate firms involved and their assigned responsibilities.
5. Key principal and associate staff involved, along with their assigned responsibilities.
6. Project schedule (initial schedule and actual/final schedule), including an explanation of delays, if any.
7. Key design/construction challenges and solutions.
8. Public Involvement process.
9. Initial project budget and final project cost. List design fees and construction costs separately.
10. Project references including current names, addresses, telephone numbers and email.
11. Identify all public agencies that reviewed the project.

E. Core Services

1. Provide a brief description of the firm's capability to perform the following:
 - Provide engineering services,
 - Completing projects efficiently and timely is imperative. Provide examples of your firm's successful track record for project completion.
 - Discuss experiences developing construction plans, specifications, and cost estimates in coordination with a municipality as part of a turn-key design service from feasibility study through preparation of final construction documents.
 - Describe the proposed project team's experience with a minimum of two (2) successful contracts. Please provide references including current names, addresses, telephone numbers and email.
2. Provide a brief description of the firm's approach to the following:
 - Performing Construction Engineering and Inspection Services on an on-call basis, including the firm's understanding of their responsibility regarding safety, contract administration, environmental responsibility, claims, and project delivery. Identify key team members and their experience administering and inspecting projects. This would involve full time resident engineer and inspection services, to include contract bidding and award, shop drawing review/approval (if needed), review/recommendation on field changes to the original design, pay request review/approval, and as-built documentation. Indicate whether this service would be in-house or subcontracted.

F. Project Management

1. Describe the project team's method of cost control.
2. Describe method of keeping pre-construction activities, to include Design, Environmental Documentation, and final package on schedule.
3. Approach to ensuring accurate coordination during all phases of project development.

V. EVALUATION CRITERIA

The following criteria will be the basis on which consultants will be selected for further consideration (in no particular order):

- Team organization and structure- 10%;
- Project personnel qualifications, experience, knowledge, familiarity and past performance with the

- desired services, similar on-call contract experiences with local governments- 20%;
- Specialized experience of firm and related experience on similar projects within the last five years for other municipalities- 15%;
 - Past work experience with the Town of Wake Forest- 15%
 - Core Services experience; engineering services, H&H, dam design, geotechnical investigation- 30%; and
 - Current workload and firm commitment to provide personnel resources and capacity- 10%.

VI. GENERAL PROVISIONS

A. SUBMITTAL OWNERSHIP/COSTS: All responses, inquiries or correspondence relating to this Request for Qualifications will become property of the Town of Wake Forest when received. Drawings, tracings, specifications, reports, models, computer discs, renderings, copyrights, and all other documents to be prepared and furnished by the Consultant pursuant to specific projects undertaken by the successful proposer, are the sole property of the Town of Wake Forest, whether the project for which they are made is executed or not, and may be used by the Town of Wake Forest as they see fit. If such documents are used on another project or for another purpose by the Town of Wake Forest, the Consultant shall not be responsible for such use, and shall not receive additional compensation. All costs for development of the written submittal and the oral presentation are entirely the obligation of the Consultant and shall not be remunerated in any manner by the Town of Wake Forest.

B. NON-WARRANTY OF REQUEST FOR QUALIFICATIONS: Due care and diligence has been used in preparing this RFQ. However, the Town shall not be responsible for any error or omission in this RFQ, nor for the failure on the part of the Consultants to ensure that they have all information necessary to effect their submittals.

C. REQUEST FOR CLARIFICATION: The Town of Wake Forest reserves the right to request clarification of information submitted and to request additional information of one or more Consultants, either orally or in writing.

D. ACCEPTANCE/REJECTION OF SUBMITTALS: The Town of Wake Forest reserves the right to accept or reject any or all submittals in whole or in part, with or without cause; to waive technicalities; or to accept submittals or portions thereof which, in the Town's judgment, best serve the interest of the Town. The Town of Wake Forest reserves the right to allow alterations, modifications, or revisions to individual elements of the Scope of Services any time during the period of contracts which result from this RFQ.

E. COLLUSION: The Consultant, by submitting a Qualifications Statement, declares that the submission is made without any previous understating, agreement, or connections with any persons, Consultants, or corporations making a competing submission on the same project, and that it is in all respects fair and in good faith without any outside control, collusion, or fraud.

F. CONSIDERATION OF SUBMITTALS: Proposals will be considered from firms/consultants normally engaged in providing and performing services as specified in this RFQ. The firm must have adequate organization, facilities, equipment and personnel to ensure prompt and efficient service to the Town. The Town reserves the right to inspect the facilities and organization or to take any other action necessary to determine ability to perform in accordance with specifications, terms and conditions before recommending any award.

G. AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE: The Town of Wake Forest will comply with the Americans with Disabilities Act (ADA) which prohibits discrimination on the basis of a disability. The Town of Wake Forest will make reasonable accommodations in all programs to enable participation by an individual with a disability who meets essential eligibility requirements. Town of Wake Forest programs will be available in the most integrated setting for each individual. If any accommodations are necessary for participation in any program or services, participants are encouraged to notify Town staff.

All work shall comply with the Americans with Disability Act along with Chapter 11 of the 2009 NC Building Code and the 2003 edition of ICC/ANSI A117.1.

H. MINORITY/WOMEN/SMALL BUSINESS ENTERPRISE: It shall be the practice of the Town of Wake Forest Government to provide minority-owned, women-owned, and small business enterprises (collectively “M/W/SBE”) as well as other responsible vendors with fair and reasonable opportunity to participate in Town of Wake Forest’s business opportunities including but not limited to employment, construction development projects, and material/services, consistent with the laws of the State of North Carolina. The policy of the Town of Wake Forest prohibits discrimination against any person or business in pursuit of these opportunities on the basis of race, color, national origin, religion, sex, age, disability, or veteran’s status. It is further the policy of the Town of Wake Forest to conduct its contracting and procurement programs so as to prevent such discrimination and to resolve any and all claims of such discrimination.

I. INSURANCE AND INDEMNITY REQUIREMENTS: To the extent permitted by law, the Consultant shall indemnify and save harmless the Town of Wake Forest, its agents and employees and assigns from and against all loss, cost damages, expense and liability caused by injury, sickness and disease to any person; or damage or destruction to property, real or personal; arising from the negligent acts, errors, or omissions of the Consultant in the performance of professional services provided to the Town. The Consultant further agrees to purchase and maintain during the life of any contracts entered into with the Town the following insurance with an insurance company acceptable to the Town of Wake Forest and authorized to do business in the State of North Carolina: Automobile: Bodily injury and property damage liability covering all owned, non-owned, and hired automobiles for limits of not less than \$500,000 each person/\$500,000 each occurrence. Comprehensive General Liability: Bodily injury and property damage liability insurance shall protect the Consultant from claim of bodily injury or property damage which arises from operations of this contract.

The amounts of such insurance shall not be less than \$1,000,000 bodily injury and property damage liability each occurrence/aggregate. This insurance shall include coverage for product/completed operations and contractual liability assumed under the indemnity provision of this contract. The Town of Wake Forest shall be listed as an **“Additional Insured”**.

Consultant’s Professional Liability: In a limit of not less than \$1,000,000.

Workers’ Compensation and Occupational Disease Insurance:

Coverage A – Worker’s Compensation: Meeting the statutory requirements of the State of North Carolina.

Coverage B – Employer’s Liability: \$1,000,000 each accident / \$1,000,000 disease – each employee/
\$1,000,000 disease – policy limits.

Certificates of such insurance with the Town of Wake Forest listed as **Certificate Holder** will be furnished to the Town of Wake Forest Purchasing Manager and shall contain the provision that the Town of Wake Forest be given thirty (30) days written notice of any intent to amend or terminate by either the consultant or the insuring company.

Randy Driver, Purchasing Manager

rdriver@wakeforestnc.gov

919. 435.9474

Town of Wake Forest

234 Friendship Chapel Road

Wake Forest, NC 27587

J. METHOD OF PAYMENT: The proposed method of payment for this contract is LUMP SUM. Payments will be made on a monthly basis for work completed during the month upon submission of an invoice, approval by the Town of Wake Forest, and accompanied by proper supporting documentation (project progress report). The selected firm must have an adequate accounting system to identify costs chargeable to the project.

K. COMMUNICATION: Respondents are advised to refrain from contact with Selection Committee members. Any specific questions regarding the Request for Qualifications should be directed to Holly Miller, Assistant Town Engineer, Town of Wake Forest Engineering Department – phone: 919.435.9443 or email: hmiller@wakeforestnc.gov.

L. RESOURCES:

1. Town of Wake Forest Structural and Dam Inventory for Parks and Greenways, 2014

M. ELECTRONIC FORMAT: The Consultant shall produce all Construction Drawings for projects in the latest version of AutoCAD. These drawings shall include accurate base drawings for the entire building / project area. Specifications shall be produced in MS Word/pdf. Final illustrative drawings and reports (if required) should be produced by Adobe Acrobat Professional or equivalent with bookmarks of sections and hyperlinks from Table of Contents to corresponding sections. Upon completion of the project, three sets of disks containing electronic files of the reports and construction documents (drawings and specifications) shall be sent to the Town of Wake Forest Engineering Department.

N. PERMITS: The Town of Wake Forest expects that the Consultant shall work with all of the various permitting agencies throughout the design process in order that code and permit related issues can be identified, resolved, and incorporated into the final contract drawings and specifications prior to being advertised for construction bids. The Town wishes to eliminate construction change orders that may be necessitated as the result of the permitting process. The Consultant shall obtain all permits and/or resolve all permit requirements prior to completion of 100% Construction Documents and award of the construction contract. It is the Town's goal to accelerate the issuance of permits so that construction can start at the earliest possible date after award of contract.

O. COMPLIANCE: All work shall be in compliance with all local, state, and federal codes.

P. ALTERNATES: If required, the Consultant shall develop documents with add or deduct alternates, and shall clearly identify these alternates in all estimates of probable cost.

Q. DOCUMENT PRINTING: At least one day prior to the date of Advertisement, the Consultant shall deliver to the Engineering Department prints of the contract drawings and specifications (quantity to be determined). At the request of the Project Manger, the Consultant shall deliver the original mylar drawings, sealed and signed by the Professional Engineer of record, and the original specification package.

R. Required/ Requested Documentation: Selected firms will have 7 business days to return any requested/required documentation for the duration that this RFQ is valid. Failure to do so may result in the firm being disqualified as a vendor.

S. E-Verify: The Contractor shall comply with the requirements of Article 2 of Chapter 64 of the NC General Statutes. Further, if the Contractor utilizes a subcontractor, the Contractor shall require the subcontractor to comply with the requirements of Article 2 of Chapter 64 of the NC General Statutes.

T. Iran Divestment Act: The Contractor shall submit a form stating that their company is not on the Final Divestment List, in accordance with the Iran Divestment Act, before being awarded a contract. The Town is prohibited to contract with any company that is on the NC State Treasurer's Final Divestment List.

END OF REQUEST FOR QUALIFICATIONS

FLAHERTY PARK DAM

General Information

Based on ESRI GIS contours and aerial imagery, Flaherty Park Dam appears between 14-16 feet tall and has a lake surface area of approximately 1.5 acres. The dam is located within the Town's J.B. Flaherty Park and has an asphalt paved trail across the crest. Flaherty Park Dam has one principal spillway system near the right abutment comprised of a medium diameter concrete pipe with flared upstream and downstream end sections. The pipe is located high within the embankment and controls normal pool. The dam has no other noticeable spillways. Flows exit the spillway pipe into a self-made small channel that flows along the right abutment. A general dam sketch is included in Appendix D.



Flaherty Park Lake & Upstream Dam Face

NCDENR does not list Flaherty Park Dam in their Inventory. Also, coordination with NCDENR did not result in any records on the dam. Due to this, the dam's small size, and lack of structures immediately downstream, the dam is very likely precluded from NCDENR jurisdiction.

Visual Inspection Observations and Recommendations

Flaherty Park Dam was visited on January 16, 2014 and June 24, 2014 by Kimley-Horn personnel. Photos taken during the visits, along with descriptions of each, are included in Appendix D. The vegetation on the dam made it difficult to pinpoint, but the dam appeared to be between 15-20 feet tall. The principal spillway concrete pipe located near the right abutment was evidenced to be a retrofit or addition to the dam and not part of the original construction. No other spillway was noted, although it is possible there was once a stand pipe riser with low-level pipe that has either been damaged or sealed and abandoned in-place.

The lake appeared to be at normal pool elevation and the concrete pipe passing base flow. Although the spillway size seems small with little freeboard, no flow over the crest of the dam or evidence of previous overtopping was noted. Town personnel also indicated no history of overtopping in a conference call.



Flaherty Park Dam: Upstream principal spillway intake

Due to the small spillway, little freeboard, and lack of auxiliary spillway, we recommend an engineer experienced in dam design perform a hydrologic and hydraulic analysis to ascertain the dam's hydraulic capacity. A small amount of dirt was accumulated within the upstream end of the spillway pipe and a small amount of stick debris was located in the outfall of the pipe. This dirt and debris should be removed periodically and after rainfall events to maintain full capacity through the pipe.

Flows exit the spillway pipe into a small earth channel with a few rocks lining the sides. The channel flows around the dam embankment and discharges downstream into the woods. The channel geometry and location should be monitored

for change in size or location and repaired if there are signs of erosion or scour that would impact the dam embankment.

The upstream and downstream faces of the dam were covered in brush and small tree vegetation making it difficult to ascertain the condition. However, there were areas of sparse vegetation on the upstream slope, along the crest, and near the spillway intake. The entire embankment should have the inappropriate vegetation removed and replaced with appropriate vegetation and then mowed regularly.

The downstream face appeared steep and was not uniformly sloped. As a general rule of thumb, the maximum slope on the downstream face should be 2H:1V. Also, small diameter trees are growing on the downstream embankment. The downstream slope had a fair amount of observable seepage near the toe with hydrophilic plants and mineral/bacteria stained water. In addition, a small longitudinal crack in the asphalt trail along the dam crest was noted which could be a sign of instability in the embankment. Although it is likely a sign of asphalt condition, the cracking should be monitored for change. Kimley-Horn recommends that the Town seek consultation from a geotechnical engineer experienced with dams. It is likely that they will suggest that the trees should be removed, the slope reworked and flattened, the seepage mitigated, and a good stand of grass established. After the embankment is reestablished, it should be mowed regularly and observed for signs of seepage.

We recommend that the hydraulic engineering assessment and the geotechnical assessment occur concurrently. We anticipate the results will indicate rehabilitation of the embankment and the spillway system, and it would be beneficial to synchronize the design and construction of the rehabilitation.



Flaherty Park Dam: Vegetation on downstream face



Flaherty Park Dam: Seepage & hydrophilic plants on downstream face

February 9, 2016

Holly Miller
TOWN OF WAKE FOREST
301 S. Brooks Street
Wake Forest, NC 27587

Re: Flaherty Park Dam
Wake Forest, North Carolina
GeoTechnologies Project No. 1-16-0066-EA

Dear Ms. Miller:

GeoTechnologies, Inc. was requested to perform an inspection at the Flaherty Park Dam and to evaluate whether or not it is subject to inclusion on the Dam Safety State inventory. Flaherty Park Dam is not on the Dam Safety inventory at present, and the height of volume of the lake place it in a category which would not require it be included in the inventory unless there are structures downstream which would result in a potential for significant property damage or loss of life in the event of a failure.

Flaherty Park Pond actually includes an upper dam and a lower dam. We understand that the upper dam failed many years ago and was subsequently repaired apparently by removing a bottom drain and then installing a RCP concrete pipe to act as a principal spillway on the right abutment as shown by the attached photographs. A recreational walking or jogging path extends across the top of the dam as shown by the attached photographs, and the downstream face appears to be a little oversteep and has signs of significant seepage. However, we understand that the pond holds enough water to perform satisfactorily for the intended purpose.

The lower pond is a small pond with an oversteep embankment and large trees growing on it as shown by attached photographs. There is a ditch cut on the left abutment which appears to be the primary spillway and the emergency spillway, and there is a ductile or cast iron bottom drain which turns up and is exposed in the lake as shown by attached photographs. The iron pipe is rusting at the outlet and if there ever was a trash rack on top of the inlet, it now appears to be gone. Additionally the downstream slope is quite steep although there are no signs of instability or seepage below the dam.

REMOVAL OF DAM FROM STATE INVENTORY

Based on the topography and flood mapping in the area and the presence of a new roadway crossing with culvert penetrations immediately downstream of the two ponds, it is our opinion that a failure of this dam would not significantly jeopardize downstream properties. Furthermore, the height of the dam and the amount of water contained are below those which would make it a mandatory regulated dam under current State regulations. On the basis of these findings, we have prepared a letter to NCDENR Dam Safety requesting their concurrence that it is not a regulated dam so that the Town can proceed with desired modifications without oversight from Dam Safety.

NEED FOR REPAIRS

Once the dams have been removed from the State inventory, we strongly recommend that an H&H study be performed to determine the appropriate sizing of emergency and primary spillways for both the upper and lower ponds. That information can then be used to determine the most efficient and economical outlet works for the upper pond in particular.

In addition to revising the outlet works for the upper pond, it is recommended that the downstream face be flattened by adding additional soil over a blanket drain constructed on the face. This repair would be accomplished by using a siphon to temporarily dewater the pond with that siphon potentially being left in place as a permanent bottom drain. Once the water has been drained, all vegetation and topsoil would be stripped off the downstream face of the dam, a blanket of C33 concrete sand with less than 3% passing the #200 sieve would be placed to a depth of 12 inches on the face of the dam to just above 1/3 the height of the dam and in areas with visible seepage prior to lowering of the pond level, and the downstream face would then be flattened to an angle of 3H:1V with soil compacted to 95% of the standard Proctor maximum dry density. Water collected in the drainage blanket would be directed to a trench drain which in turn would be connected to an outlet pipe which could be monitored in the future so that the amount of water being discharged could be periodically checked.

For the lower embankment, we strongly recommend having a qualified contractor grout up the bottom drain in order to prevent potential failure of that pipe within the dam which in turn could then cause failure of the embankment along that outlet works. In conjunction with that, the H&H data from the upstream pond would be used to size a channel in the location of the current channel on the left abutment, and that channel would be hardened with geotextile fabric and rip rap to serve as a permanent primary and emergency spillway for the lower pond unless the Town elects to install a drop inlet and piping. A permanent siphon would not be installed at this time however the large trees should be removed and consideration should be given to flattening the downstream slope to 3H:1V.

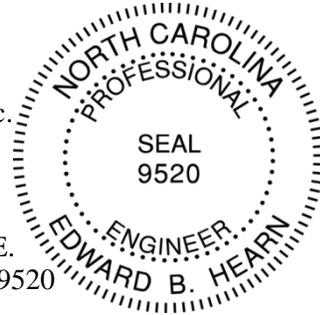
These repairs can be implemented more quickly and with less review and official oversight if the dam is not a regulated dam within the Dam Safety system. The reduction in engineering costs probably will save in excess of \$20,000 and will speed the repair process up significantly by eliminating multiple resubmittals for a set of State approved plans which take substantial review time, particularly given the very large work load for the review agency at this time. It will not substantially change what needs to be done nor will it substantially change the cost of what those repairs will be from a construction standpoint. We have previously indicated that if Dam Safety is not involved, that we believe the repairs to these dams probably will involve a cost on the order of about \$150,000, although this cannot be confirmed until H&H studies are prepared, topographic data is obtained, and a preliminary repair plan has been developed for preliminary pricing by a few select contractors specializing in this type of work.

We appreciate the opportunity to have provided you with our services during this phase of the project. Please contact us if you have questions regarding this report or if we may be of further assistance.

Sincerely,

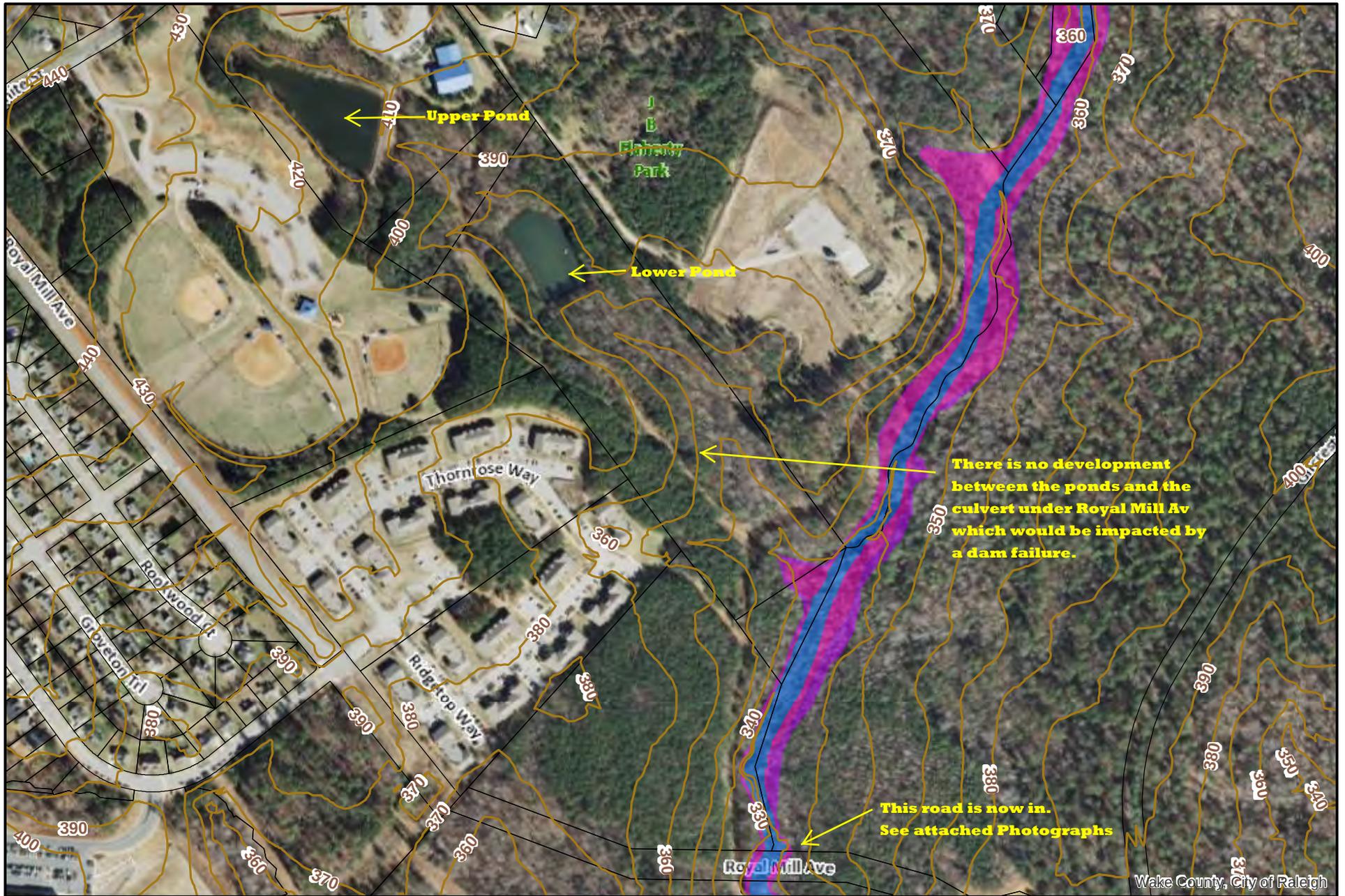
GeoTechnologies, Inc.

Edward B. Hearn, P.E.
NC Registration No. 9520

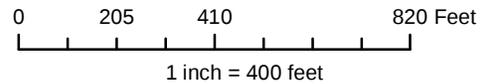


EBH/pr-dli/lmw
Attachments

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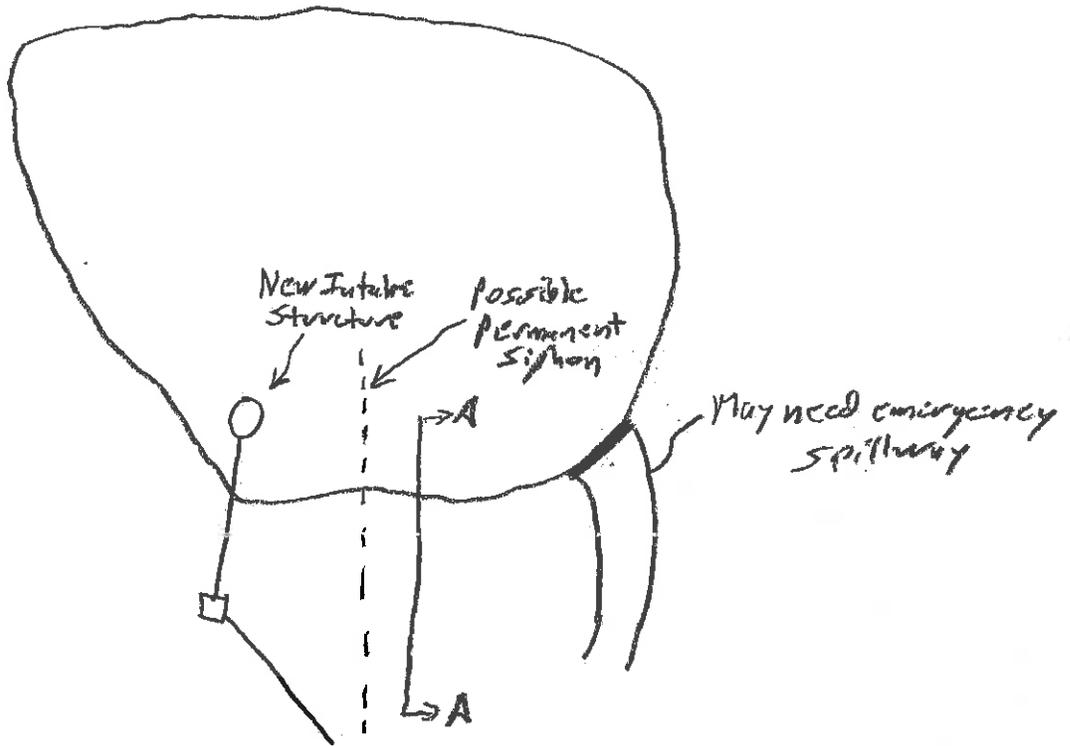
Flaherty Park



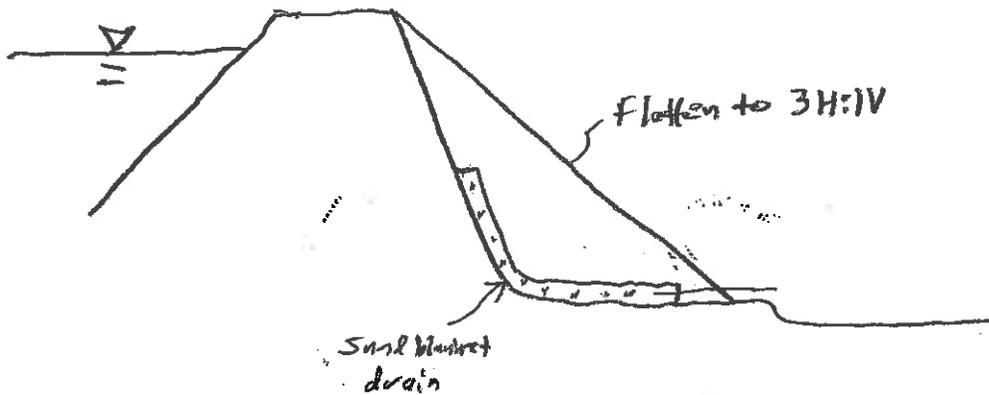
Disclaimer
 iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are NOT surveys. No warranties, expressed or implied, are provided for the data therein, its use, or its interpretation.

FIGURE 1

POTENTIAL MODIFICATIONS TO UPPER DAM



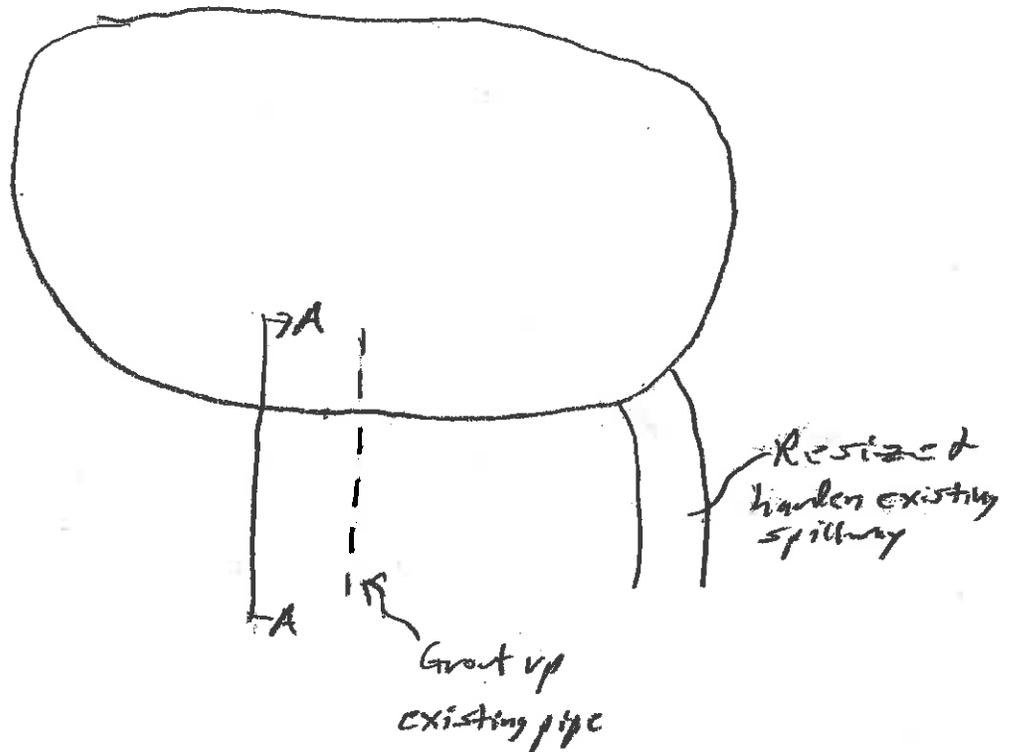
Section A-A



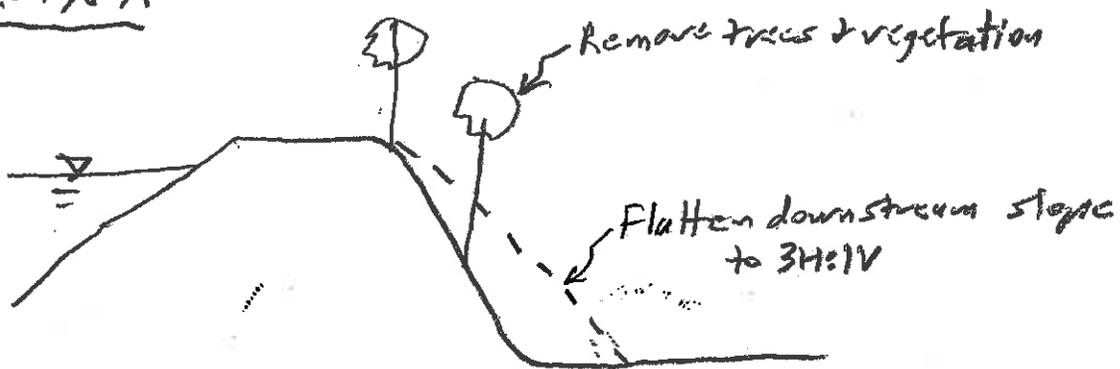
Note: Need H&H study to size outlet works.

FIGURE 2

POSSIBLE MODIFICATIONS TO LOWER DAM



Section A-A



Notes: H&H study is needed to size spillway channel.

FIGURE 3



1

Upper Flaherty Pond



2

Upstream Face



3

Downstream face



4

Primary spillway inlet



5

Primary spillway outlet



6

Seepage at toe of dam



7

First culvert downstream of Flaherty

LOCATED at ROYAL Mill AVENUE



1

Lower Flaherty Pond



2

Large Trees on Dam



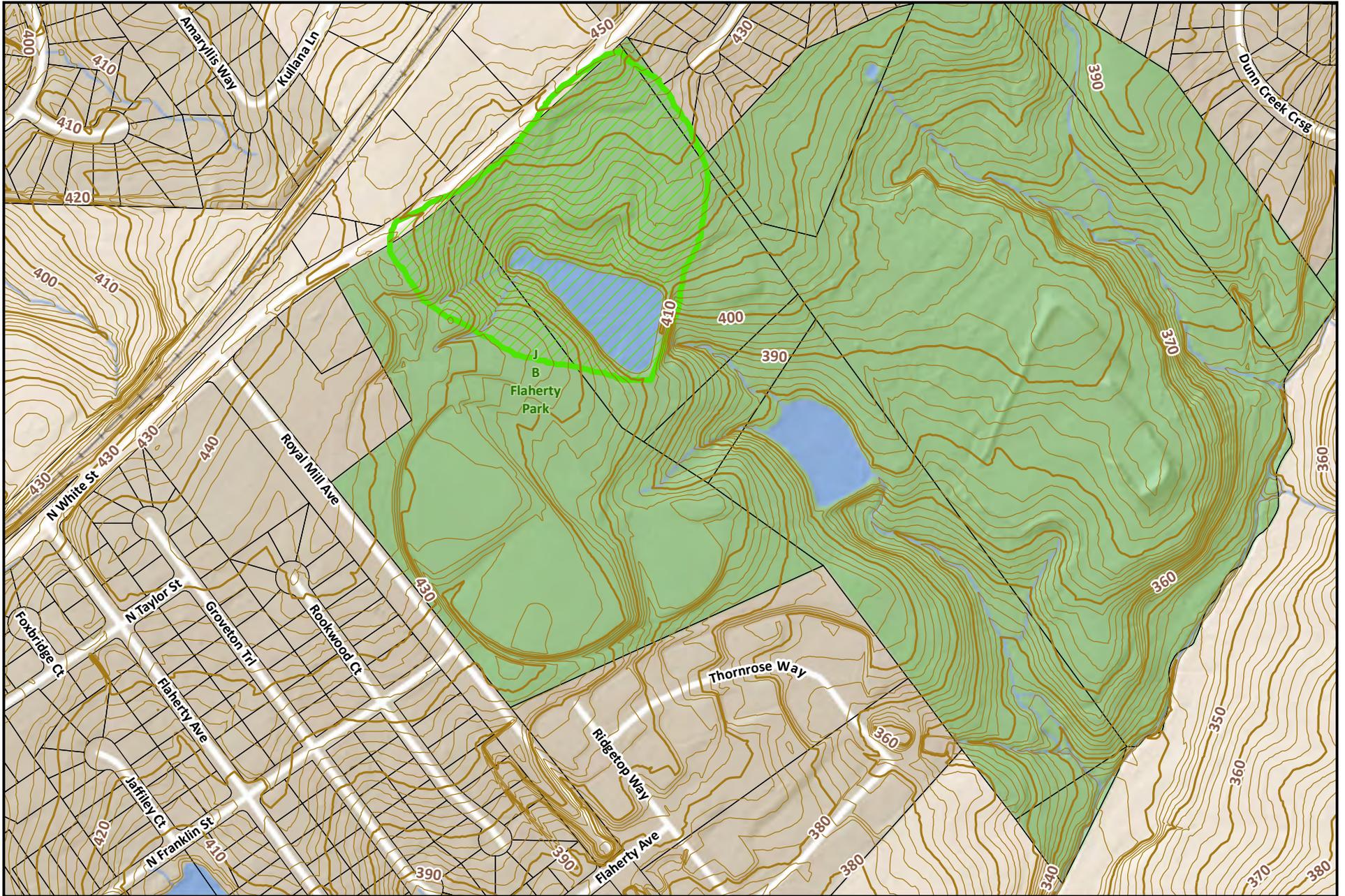
3

Primary/ Emergency Spillway

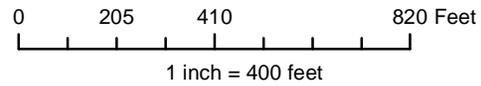


4

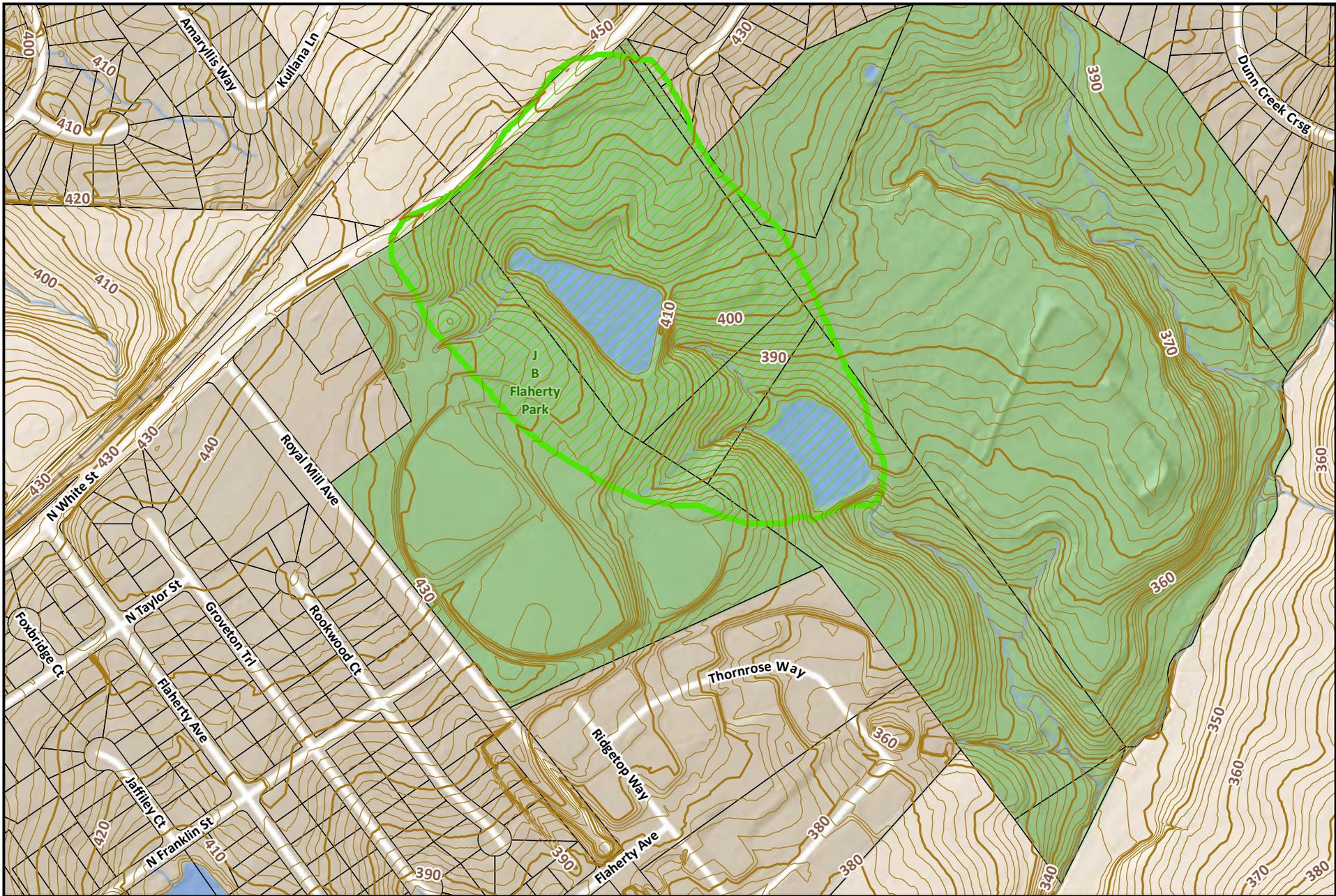
Outlet Pipe Below Dam is Rusting



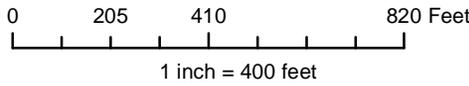
Flaherty Dam 1 impoundment area = 13 acres



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Flaherty Dam 1+2 impoundment area = 29 acres



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