



MONTGOMERY COUNTY DEPARTMENT OF PARKS
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MCPB
Agenda Item No. 6
Date: 12/06/07

November 29, 2007

MEMORANDUM

TO: Montgomery County Planning Board

VIA: Mary R. Bradford, Director of Parks *MRB*
Michael F. Riley, Acting Deputy Director *MFR*
Douglas Alexander, Acting Chief, Park Development Division *DA*
Michael Ma, Acting Supervisor, Project Management Section *MM*

FROM: Andrew Frank, Project Manager *RAF*

SUBJECT: Preliminary Engineering for Dredging and Restoration of Lake Needwood in Rock Creek Regional Park.

I. STAFF RECOMMENDATION

- 1) Approval of the Preliminary Engineering for dredging and restoration of Lake Needwood consistent with the Lake Needwood Modifications project, PDF No. 098708, as proposed in the FY09-14 Capital Improvements Program (CIP).

II. PROJECT PURPOSE

Since the discontinuance of regular maintenance dredging of the forebay and upper reaches of Lake Needwood in 1990, significant quantities of sediment have accumulated in the lake. The goal for this project is to remove approximately 100,000 cubic yards (CY) from the forebay and upper portion of the lake to improve recreational use and water quality. The project will also include improvements to the existing forebay to maximize sediment entrapment for future dredging, such as a weir structure to increase the retention time of the basin. Additionally, this project will include wetland planting enhancements and non-native invasive management within the northern most cove along the eastern shore of the lake to improve local habitat and water quality.

Staff contracted with the consulting firm of F.X. Browne to perform Preliminary Engineering development for this project under the existing level-of-effort PDF entitled

Pollution Prevention and Pond Repairs. Following approval of the FY09-14 CIP budget, F.X. Bowne will proceed with detailed design, permitting, and construction management for the overall project.

This is a large-scale dredging project that is required to restore the lake to the condition that existed during the period of the regular maintenance program that ended in 1990. The intent going forward is to establish a regular lake management program, funded through the existing Pollution Prevention and Pond Repairs PDF, which would include periodic maintenance dredging within the forebay to prevent the current level of sedimentation in the upper portion of the Lake from redeveloping in the future. Park staff will also be investigating future stream restoration projects upstream of the Lake, funded through the existing level-of-effort PDF entitled Stream Protection - SVP, which would reduce the sediment load to the lake caused by stream bank erosion.

III. PREVIOUS PLANS AND PROGRAMMING

A. Rock Creek Regional Park Master Plan (October 2000)

Rock Creek Regional Park consists of 1,810 acres, developed in the 1960s, and includes Lake Needwood, a 74-acre man-made impoundment located on the main Rock Creek stream, and the smaller Lake Bernard Frank located on the North Branch Tributary, both developed for lake-oriented recreation and flood control. In the Lake Needwood area of the Park, facilities include on the west side, the Needwood Golf Course and Needwood Mansion, and on the east side, Visitors Center and Boathouse, three picnic areas, with shelters, restrooms, and playgrounds, an archery range, hiking trails, and maintenance yard. Beach Drive connects these facilities on the east side of the Lake (see Attachment A, Vicinity Map).

The October 2000 Master Plan sets forth the value of Lake Needwood in its provision to “preserve and enhance the visitor’s ability to experience the essential quality of Rock Creek Regional Park; the lakeside settings which are rare in Montgomery County, and the wooded slopes and natural resources for primarily passive recreational activities. Inherent in this statement is the need to preserve the lakes and open bodies of water for future enjoyment.” The Master Plan further notes the Lakes Needwood and Frank “Essentially define the character of Rock Creek Regional Park and have enhanced recreational values of the park by providing outdoor water-based activities and natural beauty in an increasingly urban region.” In discussing the management of Lake Needwood the Master Plan recommends that the department: “Resume dredging operations from Lake Needwood on a regular basis to restore and maintain the lake as a deepwater habitat...” This project responds to the recommendations of the Master Plan by performing a major dredging project to restore the function and recreational use of the Lake and planning for future periodic maintenance dredging to maintain the condition of the Lake.

B. Lakes Needwood and Frank Sedimentation Studies (May 2000) / Rock Creek Watershed Feasibility Study (April 2001)

In 2000, a Sedimentation Study of Lakes Needwood and Frank was conducted by URS Corporation for the M-NCPPC in coordination with the Rock Creek Watershed Feasibility Study completed in 2001 for the Montgomery County Department of Environmental Protection. This study included sediment quality testing, a bathymetric survey, an evaluation of the average sediment yield rate to the forebay and lake and a study of the sediment distribution and resuspension potential.

The sediment quality testing indicated that the sediment was not contaminated and would be suitable for off-site land application. The only constituent that recorded levels higher than the US EPA Region III Risk Based Concentration (RBC) for Residential Soils was arsenic. The RBC for arsenic is 0.43 mg/kg while samples from the lake had levels between 1.5 and 4.4 mg/kg. The report noted that the levels are in the "range of natural concentrations" typically found in surface soils that are the source of the sediment. Per the report prepared by URS, "review of available published literature indicates that arsenic concentrations in U.S. and worldwide soils average from 5.0 mg/kg and 7.5 mg/kg, respectively. Thus, it is likely that the arsenic detected in the sediments is from natural processes rather than from human activities within the drainage basins of the lakes."

Based on the bathymetric survey, there were approximately 322,000 cubic yards of sediment in the Lake at the time of the survey, in addition to the estimated 120,000 cubic yards of sediment that had been removed from the Lake as part of the previous maintenance dredging operations. It is notable that the sediment volumes are approximate, and it is not practical to attempt to remove all sediment from the Lake.

A sediment yield rate was calculated to determine the annual sediment input to the Lake and calculate the anticipated life expectancy for Lake Needwood. The bathymetric survey, dredging records and watershed information were used to develop three methods of computing yield rate, resulting in estimated yield rates between 5.3 and 8.3 acre-feet per year. While remaining life expectancy for Lake Needwood was estimated to be over 100 years before the Lake becomes completely filled with sediment, the report noted that the gradual loss of open water will continue to significantly impact the usefulness of the Lake for recreational purposes. At the time of the study, it was estimated that 38 acre-feet of sediment had already accumulated in the forebay with a remaining 10 acre-feet of volume. Based on the calculated yield rate, the report indicated that the remaining volume would be filled in roughly eight years, which is evident based on the increasing sediment levels within the main Lake body.

Testing was performed to determine the characteristics of the sediment and the potential for their resuspension. The size of the sediment particles and the flow velocities for different storm events were analyzed to determine the resuspension potential in the Lake. Due to low velocities, the resuspension potential is negligible, although some variation will occur with variation of velocities so that isolated areas of sediment resuspension should be expected. If the Lake is allowed to continue to silt in, the potential for resuspension will increase and water quality within the Lake will be diminished.

C. Strategic Management Plan for Lake Needwood (September 2005)

Staff developed a Strategic Management Plan for Lake Needwood in 2005. The plan stated that the goal for the future of the Lake should be "to restore its shoreline for

recreational use, reclaiming as much of the original depths of the Lake as feasible for existing fishing and boating operations, and improve its water quality and management function, both within the Lake to realize its potential as a fisheries resource and for the downstream area". The plan highlighted that this goal is dependent on dredging the Lake to remove existing sediment. This goal will not only restore the recreational uses of the Lake, but also the flood control, stormwater management, sediment and erosion control and downstream water quality functions of the Lake.

Modifications were also proposed to the forebay as part of the Functional Plan. Since previous maintenance dredging operations ended, the forebay has become full of sediment which has essentially eliminated the effectiveness of the area at capturing sediment before it reaches the Lake. Dredging the existing sediment and increasing the retention time will restore the function of the forebay and increase its future effectiveness and reduce the amount of sediment that reaches the main body of the Lake.

Lake Needwood is stocked annually with rainbow trout by the Maryland Department of Natural Resources (MDDNR) along with regular stockings of tiger muskies. The Lake also has populations of largemouth bass, sunfish and catfish. MDDNR encourages and supports all dredging efforts as the sediment and nutrient loads in the Lake are contributing to reducing the fishery potential. Other Functional Plan recommendations to increase recreational opportunities at the Lake such as a pier, designated fishing access, or water park are not proposed as part of this project and would require independent facility planning.

D. Other Lakes Owned by M-NCPPC

M-NCPPC owns numerous water bodies throughout Montgomery County including stormwater management (SWM) ponds, farm ponds, nature ponds, irrigation ponds, and lakes. Structural maintenance of all SWM ponds on M-NCPPC property is the responsibility of the Montgomery County Department of Environmental Protection under an existing agreement between the agencies. Likewise, maintenance of non-SWM facilities on the golf courses operated by the Montgomery County Revenue Authority is the MCRA's responsibility based on the lease agreement. Other small non-SWM ponds are maintained under the existing level-of-effort PDF entitled Pollution Prevention and Pond Repairs. There are also several larger lakes on M-NCPPC property including Lake Frank, Little Seneca Lake, and the lake above Burnt Mills Dam. Sedimentation within Lake Frank was studied in the 2000 Sediment Study, but has never been dredged and is considered a lower priority due to its natural setting and lack of recreational programming. Little Lake Seneca is operated by WSSC, and they are responsible for maintenance including dredging. Burnt Mills Dam, which was built by WSSC circa 1930 and was acquired by M-NCPPC in the 1990's, is a "run-of-the-river" facility that no longer serves a practical function and contains significant sediment above the dam. Staff believes future planning efforts are required to determine the best long-term management plan for Burnt Mills, which may require a future stand-alone PDF for modifications and/or stabilization.

IV. PROJECT DESCRIPTION

A. History of Lake Needwood

Lake Needwood was constructed in the late 1960s by the Soil Conservation Service (SCS), now the Natural Resources Conservation Service (NRCS), a part of the United States Department of Agriculture (USDA). The purpose of the lake was watershed protection, flood control, sediment control and recreation. The original sediment control program consisted of three parts; 1) a flocculent was to be added to the main tributaries upstream of the forebay, 2) the sediment was to be confined to the forebay, and 3) the sediment was to be removed from the forebay.

The flocculation process was abandoned early in the Lake's life, but the forebay and upper portion of the lake continued to be dredged up until 1990. Previous dredging operations consisted of hydraulically dredging the sediment to the decanting basin where the material was dewatered and later moved to other locations. The work was performed by Parks personnel staff using a hydraulic dredge owned by M-NCPPC. Records show that over 120,000 cubic yards of material were dredged from the Lake over the course of about 20 years.

The Report on Lake Dredging and Sediment Control by USGS dated January 5, 1974 indicated that the life expectancy of the Lake was about 50 years. The study conducted by URS in 2000 estimated that the Lake would become completely filled with sediment in 100 to 150 years if no maintenance is performed, although the useful life would be shorter than that as the area of open surface water decreases.

B. Dredging Process

For this project, both hydraulic and mechanical dredging methods were evaluated. Mechanical dredging involves lowering the lake water level and removing the relatively dry material with a backhoe, bulldozer or dredge line, and hauling it to a disposal area using dump trucks. Hydraulic dredging is completed by floating a barge over the area to be dredged and using a cutter vacuum system to pump a mixture of sediment and water to a decanting basin where it can be dewatered, and the water returned to the lake.

The forebay is currently filled to capacity with sediment and will need to be mechanically dredged as there is very little open water to float a barge. In the upper portion of the Lake, both methods were considered. The water depth in this area, even at normal pool elevation, is very shallow due to the large deposits of sediment. During the summer months of this year, the lake level was low due to drought conditions, exposing a large area of the sediment, which appeared to be relatively compacted. Additionally, due to the large amount of sediment required to be removed to meet the goals of this project, the capacity of the existing decanting basin would have to be significantly increased to dewater the slurry pumped from the lake. This expansion would add significant cost to the project and create additional resource impacts in the area surrounding the existing decanting basin. Based on this information, we found that mechanical dredging would be the preferred method to complete this project.

The dredging will be scheduled to begin in the fall, after recreational uses on the Lake have ended for the season. As recommended by the Maryland Department of the Environment (MDE), the Lake will be lowered at a rate of six inches per day for a total of

five to six feet in order to dewater the sediment that will be removed. The sediment will be allowed to dewater for a period before construction begins. The stream flow will be maintained through the construction area to the body of the Lake. Lowering the Lake slowly will allow fish and other wildlife to migrate to deeper areas of the Lake. It was brought to our attention that this time of year is when the snapping turtles bury themselves in the mud of shallow water to hibernate. As has been done during other dredging projects, any turtles located during the construction will be set aside and relocated.

C. Disposal of Materials

A major concern for this project was the disposal of the dredged material. A significant amount of material will be removed from the Lake and the desire was for the material to be disposed of at one site to limit disturbance and set-up costs. A number of areas within M-NCPPC properties were considered for disposal sites. Please refer to Figure 2 in Attachment A for a map of the disposal sites that were considered. Many parameters were considered in the site selection process including location, potential disposal volume, ownership, current and future land uses, distance from the Lake, natural and historic resources and topography.

Another consideration for the disposal of the sediment was the quality and condition of the sediment. Based on the soil testing performed as part of the URS study in 2000, there are no issues with the material being contaminated and is suitable for land application. This is consistent with the findings of a USEPA/USCOE paper entitled "Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework", which notes that "broad use of dredged material disposal sites has been made by the agriculture, forestry and horticulture industries." Further testing will need to be done to the ultimate surface soils of the fill site to determine the need for soil amendments for different types of vegetation depending on the ultimate restoration of the disposal site. Depending on the use and finished grading of the fill area, different levels of augmentation of the soil may be necessary to support vegetation.

D. Disposal Site Selection

The potential disposal sites were analyzed based on the parameters identified above. From that selection process, it was clear that the parcel (known as the Winchester Property) between the proposed Inter-County Connector (ICC) project and the existing Rock Creek Maintenance Yard would be the best choice for the disposal of the dredged material. This property was purchased by the State Highway Administration (SHA) for the construction of the ICC, but there are approximately 13 acres outside of the project's limits of disturbance (LOD) that are ideal for placement of the dredging spoils. The access to the site would be along Needwood Road and would be within one-half mile from the proposed dredging operation. This significantly reduces haul costs and the time spent by construction vehicles on public roadways. Disposing of the material in this location would also allow a berm to be created to buffer the park from the new ICC. This property has previously been identified by M-NCPPC for acquisition, and staff have been discussing a land transfer associated with ICC implementation. In discussions with the SHA, they have expressed the desire to utilize the site as a construction staging site until the Fall of 2010, so our intent is to schedule the dredging to begin in the Fall of 2010.

when the site becomes available. The site has approximately 13 acres of open meadow with a maximum potential disposal volume of 150,000 cubic yards, more than enough to accommodate the proposed dredging project. SHA had indicated concerns about reforestation and non-native invasive species contamination after the dredged material is placed at the site, so M-NCPPC has agreed to implement a non-native invasive management program and soil augmentation following fill placement to ensure successful reforestation. While SHA has indicated a willingness to convey this property to M-NCPPC, the details have not yet been worked out regarding the purchase, which will be funded through the existing non-local acquisition program.

The second best disposal option was determined to be the existing decanting basin system located approximately one-half mile from the forebay to the east of the Lake within Park property that was used for previous hydraulic dredging operations. The decanting basin is composed of three cells with an outlet structure in the lower cell which drains back to the Lake. The decanting basin system is not large enough to process the volume of watery dredged slurry that would be required to hydraulically dredge 100,000 CY from the lake at one time. However, the decanting basin does provide a place for disposal of mechanically dredged dry sediment. The basin has a surface area of approximately four acres and the potential for mounding the dredged material in this area to accommodate approximately 100,000 cubic yards of material. Using this site would eliminate the possibility of using the decanting basin for future hydraulic dredging efforts unless the material was removed for use on other sites. This removal would require additional funds to move the material a second time.

We believe that the ICC Site and the Decanting Basin System are the best options for the disposal of the material dredged from Lake Needwood. Should the situation arise that we are unable to use either site for material disposal, there are other alternative disposal sites available within M-NCPPC properties. However, the ICC Site and the Decanting Basins are significantly closer than the alternative disposal sites, which greatly reduces the project costs. Therefore, use of the alternative disposal areas may require additional funding or reduce the amount of material that can be dredged from the Lake. One alternative is to use one of the actively farmed fields located at the Agricultural History Farm Park located off Muncaster Road in Derwood, Maryland. The field is currently leased for agricultural practices, so the use of this site will require suspending farm activities for a period of one to two years to facilitate the construction. Another area is the Lois Y. Green Conservation Park off of Snouffer School Road in Gaithersburg. The material would be disposed of on either site by placing two to three feet of fill over the entire area. Both sites have adequate space to dispose of at least 100,000 CY of material from the project. It is noted that at the Agricultural History Farm Park there may be additional costs associated with accessing through the historic area adjacent to the area that would be used for disposal. Site access issues would also have to be addressed at the Lois Y. Green Conservation Park. Details of the Lois Y. Green Conservation Park were not specifically discussed at the Public Meeting, so staff would provide a public update if this site is ultimately used for sediment disposal.

Other disposal sites that were identified included the Gude Landfill, the National Capital Trolley Museum, the Oaks Landfill and the Rachel Carson Park. These sites were not considered optimal based on location, area available for disposal of material, ownership,

land use, and/or issues with access to the site. These locations were not presented at the public meeting held for this project and a subsequent meeting would be needed prior to any activity at these sites.

E. Public Outreach

In September 2007, staff notified surrounding property owners, media, and civic associations of a public information meeting regarding the proposed project. The meeting was held on September 25, 2007 at 7:00 PM in the Activities Center at the Agricultural History Farm Park Multi-Purpose Room. In attendance were several representatives from M-NCPPC, a reporter with a local paper and six residents (see attached attendees list) as well as Dr. Frank Browne and Megan LeBoon with F. X. Browne, Inc. Andy Frank (M-NCPPC Project Manager) provided an introduction and project overview and Megan LeBoon discussed the need for the project, current design concepts and project benefits. Overall, the response from the public to the project was very positive. Attendees were aware of the current condition of the lake and support the rehabilitation effort.

F. Environmental Issues

There are a number of significant existing environmental resources within and surrounding Lake Needwood that need to be addressed as part of the dredging project.

As discussed earlier, the lake level will be lowered to allow the sediment to dry to facilitate the mechanical dredging. This will be done slowly, at a rate of 6 inches per day, in order to allow fish and other wildlife to move to deeper water and avoid being stranded once the water recedes. Any turtles located during the construction will be set aside and relocated in coordination with Park staff.

Due to the lack of maintenance and subsequent sedimentation of the forebay, a number of wetland plant species have become established in this area. Based on conversations with the United States Army Corp of Engineers (USCOE) and the MDE Wetlands and Waterways program, the dredging of the forebay is considered a maintenance activity which does not require mitigation for any wetland disturbance.

The 2000 Sediment Study for the dredging of the Lake suggested that a portion of the material might be disposed of along the shore to create a wetland area. A small cove on the north east of the Lake was identified during this project to build a constructed wetland. Due to natural sedimentation processes in that area, the area has become filled with sediment and vegetation has started to develop. Based on discussions during a field meeting with MDE, this area is currently developing into a wetland, so improvements associated with this project will be limited to installing additional native plantings to enhance the wetland habitat.

Lake Needwood is fed by the main stem of the Rock Creek. The flow will be maintained to the main body of the Lake during the first phase of construction. During the second phase of construction, the flow will be bypassed through the dredged areas to the main body of the Lake so that the remaining area can be dredged.

The sediment will be partially dewatered on-site and transported to the disposal area in dump trucks on public roads. Special care will be taken to prevent dredged material from

leaking or spilling into the roadways, which may require that trucks used for sediment hauling have sealed tailgates and covers. Stabilized rock construction entrances will be installed at all accesses to the site to prevent dirt from being tracked onto the roadway from the construction site.

Sediment quality samples were analyzed as part of the URS Sediment Study in 2000. The results of their analysis indicated that the material was not hazardous. The only constituent found to have a level above that of the US EPA Region III Risk Based Concentration (RBC) for Residential Soils was arsenic. The report stated that high arsenic levels are within the range of natural concentrations and is likely from natural processes. The report further noted that higher arsenic levels "is a common occurrence in the Piedmont Physiographic Province, as well as other areas of the United States, where soils naturally contain levels of arsenic higher than regulatory limits." The report went on to state that "based on these results, we believe that it is highly unlikely that the dredged materials would be categorized as a hazardous or contaminated material, requiring special treatment and disposal." Therefore, we do not believe that disposal of the dredge materials would create an environmental concern at any of the sites considered.

G. Design and Construction Permitting

1. Alternatives Considered

A number of alternatives were considered in the development of the dredging project. One concept was to build out the shoreline on the northwest corner of the Lake with a stone wall to create a fishing access. This would have slightly reduced the amount of material to be dredged as the material behind the proposed wall would have remained and additional material from the Lake would have been used to fill the area. In discussions with USCOE and MDE it was determined that the construction of a wall in this area would be considered a fill of open water and would create significant permitting issues.

Another alternative that was considered was the creation of a wetland along the shoreline with material dredged from the Lake. A cove area along the northeastern shore of the Lake was identified as a potential area for this constructed wetland. Based on field investigations of the area, a large portion of this area has naturally filled with sediment and wetland species have become established. During our site visit with representatives of MDE, they expressed that the area seems healthy and does not need to be altered but could be enhanced with additional wetland plantings.

A previous study that looked at the feasibility of dredging the Lake recommended constructing a weir between the forebay and Lake to increase the retention time and storage of the forebay during storm flows. The design, however, would cause a 24 acre area to be flooded during the one year storm event, which may also create negative impacts on stream function. Part of this project may look at constructing a smaller weir structure to increase the retention time during base flows. Other forebay enhancements being considered as part of the detailed design include a meander or other elongated flow path.

The water level of the Lake fluctuates seasonally and with storm flows but averages an elevation of 324.5 feet above mean sea level. Part of the goal of this project is to re-establish a typical water depth of four (4) feet in the upper portion of the Lake for boating access. One alternative to dredging the sediment from this area is to raise the dam to increase the water surface about the sediment. Raising the dam, however, would cause a much larger area to become flooded and would have significant impacts to Needwood Road which serves as an impoundment between the forebay and the main body of the Lake. Raising the dam would also have considerable dam safety issues.

2. Design Recommendations

The primary goal for the dredging project is to maximize the efficiency of the forebay. It is critical for the life and health of the Lake that as much of the sediment as possible be confined to the forebay area. This will help maintain water depth and quality in the upper portion of the Lake as well as limit future maintenance dredging needs to the forebay as much as possible. The forebay will be designed to maximize the retention time which will maximize the percentage of particles that settle out in the forebay. The forebay has a surface area of six (6) acres, which is significantly undersized for a drainage area of 8,173 acres. Due to the steep topography surrounding the forebay area, it is not possible to increase the area further. As part of this project volume and retention time of the forebay will be designed to maximize the potential of the available area.

Based on the budget estimate and dredging feasibility, it is estimated that 100,000 cubic yards of sediment should be removed from the forebay and upper lake region as part of this project. It is important that the volume of removal be distributed to get the most out of the project and by removing material from the forebay, its sediment trapping function will be restored. Likewise, by removing material from the upper portion of the Lake, the area available for recreational use will be substantially improved. The goal is to remove as much material as needed to repair the forebay and dredge the remaining volume from the Lake. In the upper portion of the Lake, the design will increase the water depth in that area to a minimum of four (4) feet for boating access as much as possible and potentially create some deeper pockets for improved fish habitat. Initial estimates indicate that approximately 50,000 cubic yards of material will be removed from each area in order to meet the project goals. The estimates are based on data from the 2000 bathymetric survey as well as additional information gathered in the field as part of this project. The sediment continues to increase in parts of the lake and field adjustments will likely be necessary at the time of construction to maximize the benefits from the dredging project.

3. Permitting Issues

For this project, a Joint Federal/State Application for the Alteration of any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland will be submitted for review by MDE and the USCOE through the MDE Division of Dam Safety. In both the forebay and lake area, wetlands species have become established due to the lack of maintenance and sediment levels. A meeting was held with the Inter-agency Wetland Committee and a site visit took place with staff from MDE to review the project. Based on those meetings, both MDE and USCOE have indicated that they will view this project as a maintenance

activity and no wetlands mitigation will be required for any disturbance. Please refer to Appendix E for the minutes of the aforementioned meetings.

A meeting was held with Environmental Planning staff to review the Preliminary Engineering Plans for compliance with the Forest Conservation regulations. It was determined that the project would qualify for an exemption under section 22A-5(t)) Modification to an Existing Property. Please refer to Appendix D for the minutes of the meeting with Environmental Planning Staff.

The necessary permits will also be obtained from Montgomery County; an Erosion and Sediment Control Permit, a Floodplain District Permit and Access Permits for each point of entry from the public right-of-way.

H. Future Maintenance Program

Regular dredging of the forebay will be planned on a 6-8 year cycle in order to maintain the efficiency of the forebay. The design and construction of those future maintenance projects will be provided through the existing level-of-effort PDF entitled Pollution Prevention and Pond Repairs. Given the size and nature of the forebay, it is likely that large storm events with large sediment loads would transport material into the main body of the lake, which may require maintenance dredging of that area.

Previous studies have highlighted that much of the sediment loading to the lake is caused by stream erosion. We will investigate stream restoration opportunities within the watershed which may reduce sediment load to the Lake. This could help to reduce the dredging requirements in the forebay as well as reduce the sediment loads from other tributaries that do not flow through the forebay. Any stream restoration projects will be pursued through the existing level-of-effort PDF entitled Stream Protection - SVP.

V. RECOMMENDATIONS

1. In order to re-establish the recreational uses of the upper portion of the Lake, this project proposes to mechanically dredge approximately 50,000 cubic yards of sediment in order to achieve four feet of water in that area in order to accommodate boats. Some areas may be dredged further, as feasible, to provide increased fish habitats.
2. Approximately 50,000 cubic yards of sediment will be dredged from the forebay in order to restore the function of that area. The forebay will be designed to provide for efficient sediment capture. Improvements may include increased volume, increased retention time, increased flow path and/or a weir structure.
3. Wetland plantings will be provided in the area that has naturally become a wetland to enhance the habitat in that area. An invasive species management plan will be established to support the growth of the native wetland plants.
4. The material dredged from the Lake and forebay will be disposed of at the ICC site pending an agreement with SHA. Placing the material in this area will allow for the creation of a berm to buffer the park from the new highway. Soils testing will be

done to determine if any amendment of the material is required to facilitate the reforestation of the area by SHA. A management program for non-native invasive plants will be established to aid in the reforestation process. If we are unable to make arrangements with SHA for the use of this area, the existing decanting basin area will be used for temporary stockpiling of the dredged material for future use at off-site locations.

VI. PROJECT COST

The total Capital Improvements Program (CIP) project budget for implementation of Lake Needwood Modifications is \$3,836,000 in 2007 dollars, which includes costs for construction (\$2,950,000); a 25% construction contingency (\$738,000), and staff chargebacks for project/construction management (\$148,000). Refer to Attachment G – Cost Estimate, for a detailed cost estimate. Please note that this cost estimate reflects costs associated with fill placement at either the ICC or the decanting basin sites, and additional costs would be required if material needed to be transported to one of the more distant alternative locations.

VIII. ATTACHMENTS

Attachment A – Figures

Figure 1: Project Vicinity Map

Figure 2: Aerial View of Lake Needwood

Figure 3: Lake Aerial Showing Forebay Condition on April 7, 1993

Figure 4: Lake Aerial Showing Forebay Condition on April 7, 2002

Figure 5: Photo Showing Forebay Condition on September 5, 2007

Figure 6: Photo Showing Lake Condition During Drought on July 7, 2007

Attachment B – Preliminary Engineering Plans

Attachment C – Disposal Sites

Attachment D – Minutes from Meeting with M-NCPPC Environmental Planning

**Attachment E – Minutes from Meeting with Inter-Agency Wetlands Committee and
Site Visit with representatives of MDE**

Attachment F – Public Meeting Summary

Attachment G – Cost Estimate

Attachment H – Project Description Form

Attachment A

Figures

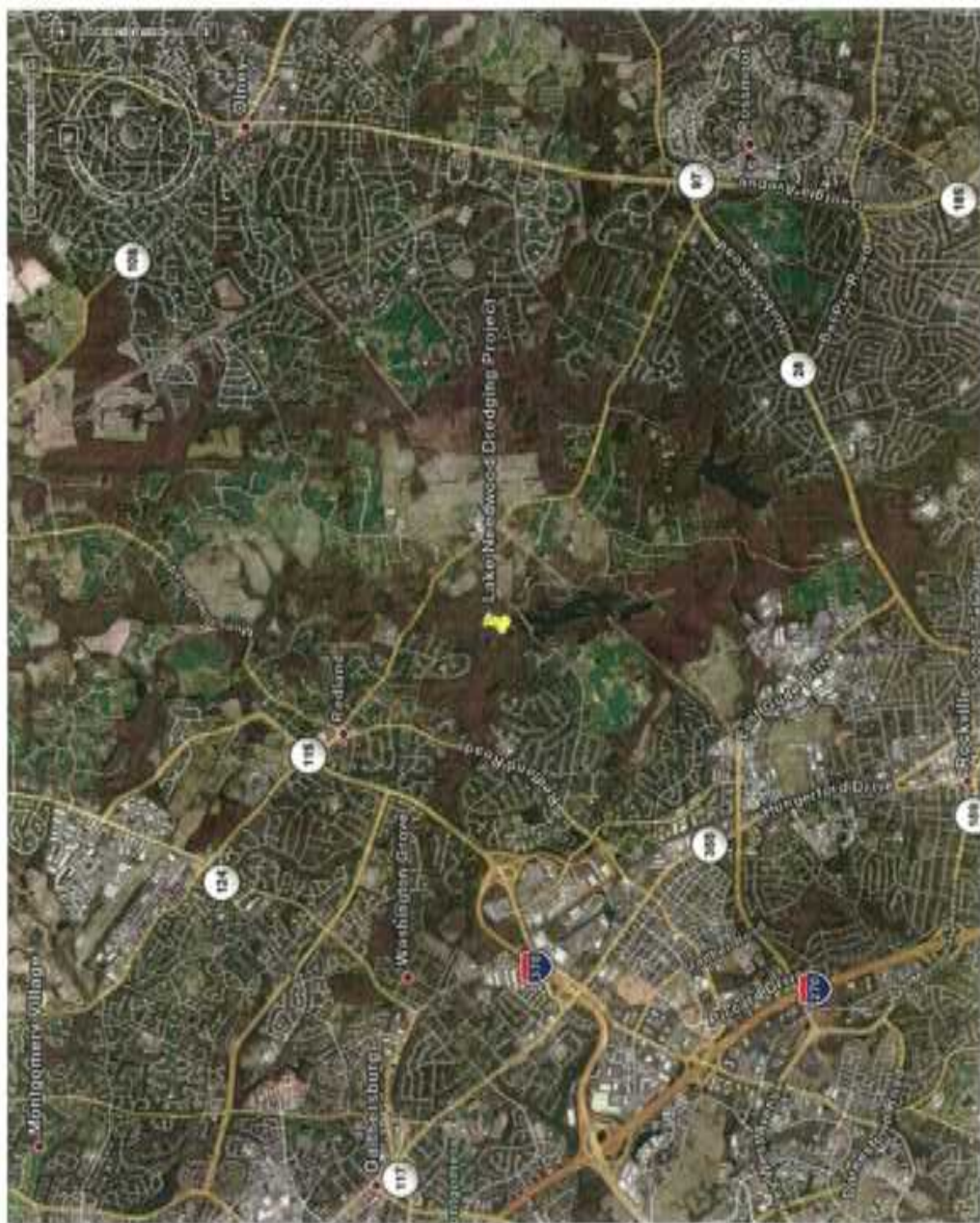


Figure 1: Project Vicinity Map



Figure 2: Aerial View of Lake Needwood



Figure 3: Lake Aerial Showing Forebay Condition on April 7, 1993



Figure 4: Lake Aerial Showing Forebay Condition on April 7, 2002



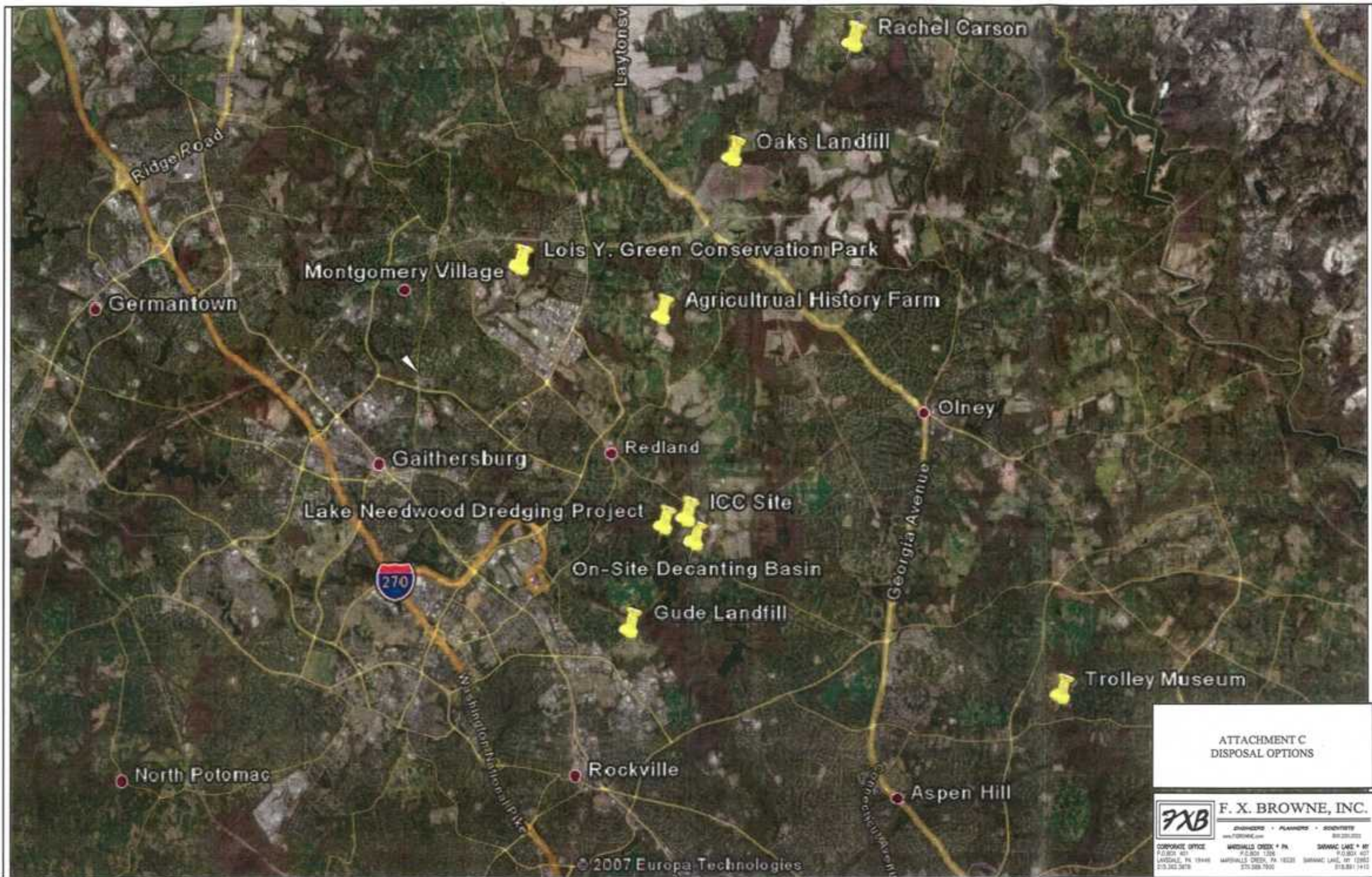
Figure 5: Photo Showing Forebay Condition on September 5, 2007



Figure 6: Photo Showing Lake Condition During Drought on July 7, 2007

Attachment B

Preliminary Engineering Plans



ATTACHMENT C
DISPOSAL OPTIONS



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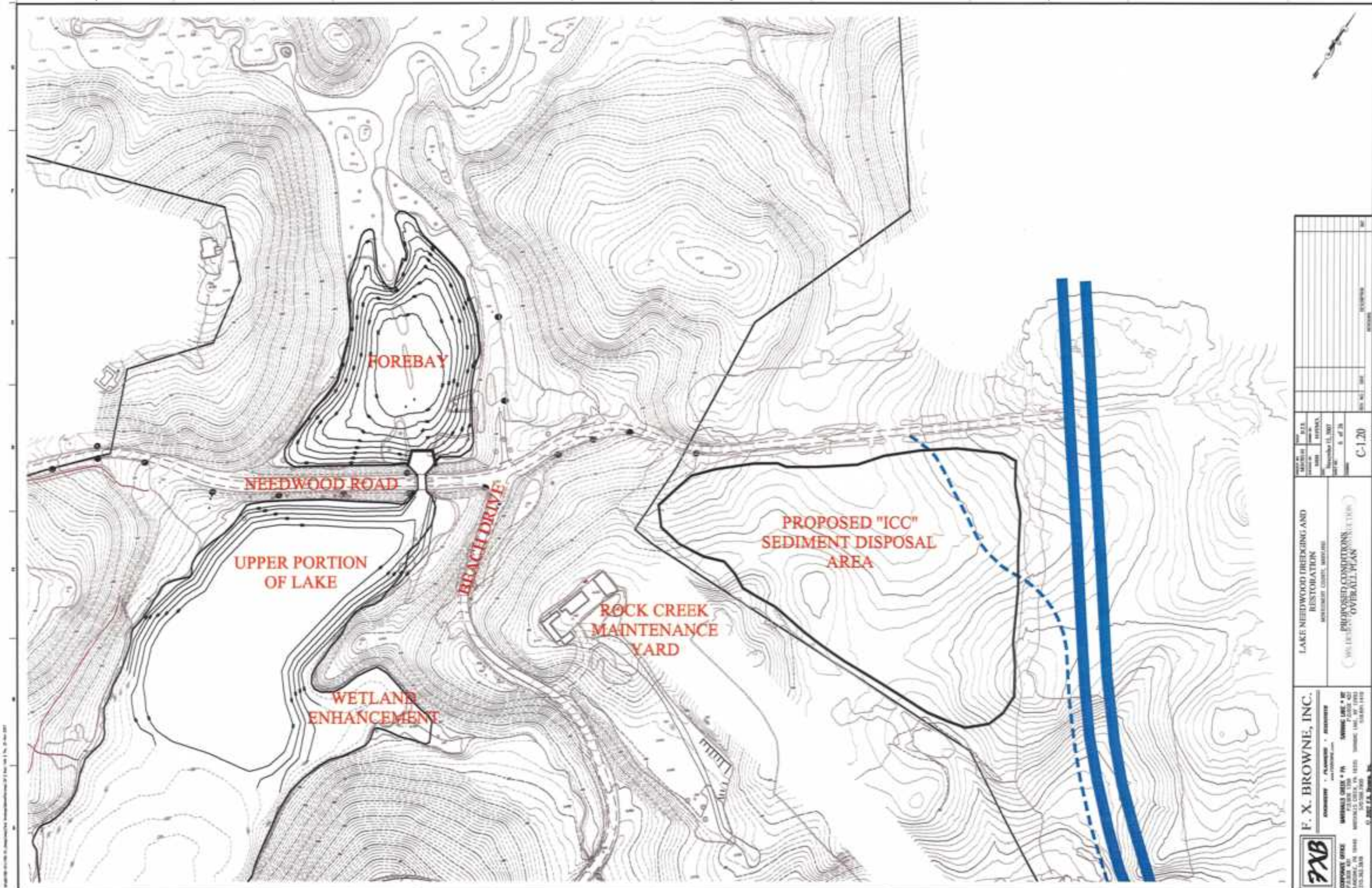
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Attachment C

Disposal Sites



10/10/07 11:00 AM F:\Projects\2007\LakeNeedwood\2007 Lake Needwood.dwg (1 of 1) 10/10/07

 F. X. BROWNE, INC. <small>ENGINEERING • PLANNING • ARCHITECTURE</small> <small>10000 W. 10TH AVE. SUITE 100 DENVER, CO 80202</small> <small>TEL: 303.555.1000 FAX: 303.555.1001</small> <small>WWW.FXBROWNE.COM</small>	LAKE NEEDWOOD DREDGING AND RESTORATION <small>MONTECALM COUNTY, MONTANA</small>		SHEET NO. C-1.20 TOTAL SHEETS 10
	PROJECT NO. 2007-001 DATE 10/10/07 DRAWN BY J. BROWN CHECKED BY J. BROWN APPROVED BY J. BROWN		SCALE AS SHOWN DATE 10/10/07

Attachment D

Minutes from Meeting with M-NCPPC Environmental Planning

Lake Needwood Dredging Project
FXB# MD1785-01

NRI/FSD Pre-Application Meeting
October 15, 2007
M-NCPPC Office
8787 Georgia Ave
Silver Spring, Maryland
Minutes Prepared By: Megan LeBoon

In Attendance: Andy Frank (M-NCPPC), Joshua Penn (M-NCPPC), Katie Ferry (FXB), Megan LeBoon (FXB)

On Monday, October 15, 2007 we met with Joshua Penn from M-NCPPC Environmental Planning, Countywide Planning Division to discuss the permitting requirements for forest conservation for the dredging project. The following issues were discussed:

- We will likely receive an exemption for Modification to an Existing Property (22A-5(t)) but we need to check on the jurisdiction of the ICC area to see if it falls under M-NCPPC or Maryland Department of Natural Resources (DNR). Subsequent to the meeting, Andy Frank spoke with Bill Gries (M-NCPPC) who confirmed that his intention is for this property to ultimately be conveyed to M-NCPPC. If we do not fall under 22A-5(t), we may fall under routine maintenance of public utilities.
- A tree survey will need to be submitted with the application for the exemption showing all trees of 24" diameter within 50 feet of the limit of disturbance for all area indicating the specimen, condition and the reason for any poor or fair classifications. These trees should be numbered on the site plan. Individual trees not included in the forest stand delineation do not need to be included. The plan should include a table of the numbered trees, their condition, and details. The plan must be prepared by a Landscape Architect, Forester, COMAR or other approved qualified professional.
- If the Agricultural History Farm Park is used as the sediment disposal site, no fill can be placed within the stream valley buffer.
- The stream valley buffer is defined as a minimum of 150 feet , and the buffer changes if there are wetlands. Use stream Class III.
- The tree survey should show the aerial extent of the canopy coverage as well as the forest line. Canopy cover is considered where there are greater than 100 trees per acre.
- The Project Area will be considered as the limits of disturbance (LOD) + 50 feet. The limits of disturbance need to include any haul route off roads.
- All areas should be submitted as one project. Any changes to the LOD will need to be resubmitted to their office for review. They should be contacted once approvals are obtained from DNR and DPS for their final approval.

- The sediment permit and the forest plan should be submitted at the same time, and if the sediment permit revisions change the limit of disturbance, Josh should be notified immediately.
- We may not need a sediment permit for sediment placed at the Ag History if the work is classified as "agricultural activity". If no sediment permit is required for the work then no NRI/FSD permit or exemption is required.
- Josh suggested talking to the NRCS about putting dredged sediment on farmland, he mentioned contacting Jeremy Chris and John Zolowtowski.
- There will be a change in the forest plan review personnel soon.
- The minutes from this meeting should be sent to Josh to confirm what was discussed.

Attachment E

**Minutes from Meeting with Inter-Agency Wetlands Committee
and Site Visit with representatives of MDE**

Lake Needwood Dredging Project
FXB# MD1785-01

Wetlands Committee Meeting

October 15, 2007

M-NCPPC Office

8787 Georgia Ave

Silver Spring, Maryland

Minutes Prepared By: Megan LeBoon

In Attendance: Andy Frank (M-NCPPC), Mark Wilcox (MC-DEP), Nadine Piontko (MC-DPS), Tina Schneider (M-NCPPC), Jack Dinne (USACE), Steve Federline (M-NCPPC), Steve Shofer (MC-DEP), Katie Ferry (FXB) and Megan LeBoon (FXB)

On Monday, October 15, 2007 we met with the inter-agency wetland committee to discuss the dredging project and get their input on the permit regulations that will be required as part of this project from the various agencies. Agencies represented at the meeting were M-NCPPC Environmental Planning, United States Army Corp of Engineers (USACE), Montgomery County Department of Environmental Protection and the Montgomery County Department of Permitting Services. Andrew Frank (M-NCPPC), Katie Ferry (FXB) and Megan LeBoon (FXB) gave an overview of the project to the committee. Generally, attendees at the meeting were supportive of the project in order to maintain the functional uses of the lake. The following issues were discussed:

- Potential funding may be available through the Maryland Department for the Environment (MDE) for the creation of the wetlands area if that area is not already a wetland.
- Jack Dinne from the Corps felt that the forebay dredging would be seen as maintenance and there would be no issues on their part with any wetland areas that may have been established as a result of sedimentation.
- The fishing area was discussed and Jack Dinne indicated that the construction of a wall and the placement of fill in that area would be seen as a shallow water fill. Due to that classification, the creation of the fishing wall will not be pursued further.
- Tina Schneider asked if an aquatic shelf can be constructed as part of the forebay restoration. This option will be evaluated further in the design of the forebay.
- We need to establish what elevation will be considered the normal pool elevation. If the existing elevation of the proposed wetland area is below that water surface, no additional material can be added to that area to increase the elevation or it will also be considered a shallow water fill.
- Jack Dinne explained that maintenance dredging on the forebay in the future should not be a permitting issue or a permitted event. However, if a wetland area is created in the lake, it would eventually be recognized as a jurisdictional wetland and subject to permitting.

The representative from the Maryland Department of the Environment was not able to be present at the meeting. A site visit has been scheduled for Monday, October 29, 2007 to look at the forebay area and determine how MDE will permit the construction in that area.

M:\MD1785-01\Engineering\Permitting\MD1785-01-Wetlands Mtg-101507.doc

Lake Needwood Dredging Project
FXB# MD1785-01

Site Visit with MDE Representatives
October 29, 2007
Lake Needwood

A site visit was conducted on October 29, 2007 to discuss the permitting requirements for the dredging project with the Maryland Department of the Environment. In attendance were Andy Frank (M-NCPPC), Doug Redmond (M-NCPPC), Mark Wilcox (MD-DEP), Pavla Cervova (MDE-Wetlands), Visty Dalal (MDE-Dam Safety) and Megan LeBoon (F. X. Browne, Inc).

Andy gave an overview of the proposed dredging project and anticipated schedule. Pavla indicated that the forebay would not be regulated by MDE as wetland impact. Since the forebay was constructed for the purpose of sediment removal the construction will be seen as maintenance. There is the possibility, however, that the vegetated area of sediment in the lake which is above the normal lake level of 324.5 will be regulated as an emergent wetland. Depending on their determination of the area of sediment in the northern portion of the lake, we may need to prepare a wetland mitigation plan for any wetlands impacts in that area. Andy requested that a decision be made by November 9th in preparation for the Planning Board meeting on November 29th.

We discussed the proposed construction of a fishing wall in the upper portion of the lake. MDE agreed with the Army Corps determination during the Wetland Committee meeting that such an activity would be permitted as filling open waters. Based on this, it was decided that the fishing wall would not be constructed as part of this project.

We looked at the area of the proposed wetland enhancement. Pavla believed that the area is probably already a functioning wetland and it would not help to build a constructed wetland in that area. There may be some opportunity for wetland enhancement with plantings, however.

We looked at the on-site decanting basin which may be used in the situation that the ICC are can not be used for sediment disposal. There should be no permitting issues with the filling of that area with the dredged material.

Pavla said that our Joint Permit application should include the original edge of the lake, the current lake contours and the proposed contours and indicate any impacts to fringe wetlands. If the water level will be maintained at a higher level, the flooding of any fringe wetlands would be seen as an impact. A wetland delineation will be performed during the design phase of the project to be included on the plans.

Visty asked if an analysis of the sediment quality had been done. An analysis was done as part of the URS study in 2000 and will be forwarded to Visty by F. X. Browne, Inc. Visty also noted that due to the distance of the project from the dam, Dam Safety has no issues with the dredging project. Dam Safety will, however, be issuing the permit for the dredging so Visty will remain involved for the length of the project.

Attachment F

Public Meeting Summary

Lake Needwood Dredging Project
FXB# MD1785-01

Public Meeting
September 25, 2007
Agricultural History Farm Park – Activities Center
18400 Muncaster Road
Derwood, Maryland

A Public Meeting was held for the Lake Needwood Dredging Project on September 25, 2007 at 7:00 PM in the Activities Center at the Agricultural History Farm Park. In attendance were several representatives from M-NCPPC, a reporter with a local paper and six residents (see attached attendees list) as well as Dr. Frank Browne and Megan LeBoon with F. X. Browne, Inc. Andy Frank (M-NCPPC Project Manager) provided an introduction and project overview and Megan LeBoon discussed the need for the project, current design concepts and project benefits. The two most likely disposal sites (parcel between ICC and Rock Creek Maintenance Yark and the Agricultural History Farm Park) were presented, and not concerns were raised about either site, although the ICC site was favored due to proximity, buffering potential from the highway, and lower costs. The issue of protecting wildlife, particularly snapping turtles during the dredging operation was raised. Doug Redmond (M-NCPPC aquatic biologist) indicated that on other dredging jobs, any turtles located by the contractor were set aside and relocated by the Commission, if necessary. Andy Frank noted that the water level in the lake will be lowered in small increments (6" per day maximum per MDE recommendations) to encourage fish and other wildlife in the lake to migrate into the lower part of the lake. It was emphasized that a large portion of the lake will remain during construction. Questions about the long term maintenance of the lake were noted. As dredging will likely be necessary periodically to maintain the function of the forebay, it was asked whether there was any consideration of completing the projects internally as previous dredging operations were completed. Andy Frank noted that the operating budget for M-NCPPC does not include maintenance dredging as it formerly did, and that it would likely be considered as periodic CIP projects. Overall, the response from the public to the project was very positive. People seem to be aware of the current condition of the lake and support the rehabilitation effort.

Attachment G

Cost Estimate

Cost Estimate

LAKE NEEDWOOD DREDGING (ICC OR DECANTING BASINS DISPOSAL SITE)

ITEM No.	DESCRIPTION	APPROX QUANTITY	UNIT	UNIT COST	TOTAL COST
DREDGING PROGRAM					
1	Mobilization and Control of Water	1	LS	\$ 50,000.00	\$ 50,000.00
2	Construct Forebay Enhancements	1	LS	\$ 150,000.00	\$ 150,000.00
3	Install Wetland Plantings	1	LS	\$ 100,000.00	\$ 100,000.00
4	Augment Soils and Stabilize	1	LS	\$ 50,000.00	\$ 50,000.00
5	Sediment Controls for Receiving Site	1	LS	\$ 50,000.00	\$ 50,000.00
6	Non-Native Management Program	1	LS	\$ 50,000.00	\$ 50,000.00
7	Dredge Sediment with Off-Site Placement	100,000	CY	\$ 25.00	\$ 2,500,000.00
Sub-total					\$ 2,950,000.00
Contingency (25%)					\$ 738,000.00
Project Management (5%)					\$ 148,000.00
Total Cost:					\$ 3,836,000.00

Attachment H

Project Description Form

Lake Needwood Modifications -- No. 098708

Category M-NCPPC
 Subcategory Development
 Administering Agency M-NCPPC
 Planning Area Upper Rock Creek

Date Last Modified
 Required Adequate Public Facility
 Relocation Impact
 Status

October 29, 2007
 No
 None
 Planning Stage

EXPENDITURE SCHEDULE (\$000)

Cost Element	Total	Thru FY07	Est. FY08	Total 6 Years	FY09	FY10	FY11	FY12	FY13	FY14	Beyond 6 Years
Planning, Design, and Supervision	156	0	0	156	0	0	156	0	0	0	0
Land	0	0	0	0	0	0	0	0	0	0	0
Site Improvements and Utilities	3,894	0	0	3,894	0	0	3,894	0	0	0	0
Construction	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Total	4,050	0	0	4,050	0	0	4,050	0	0	0	0

FUNDING SCHEDULE (\$000)

G.O. Bonds	4,050	0	0	4,050	0	0	4,050	0	0	0	0
Total	4,050	0	0	4,050	0	0	4,050	0	0	0	0

DESCRIPTION

Lake Needwood is a valued hydrological resource and recreational amenity for the County. Preservation of this resource is dependent on dredging the lake to remove existing sediment and addressing further siltation. This project will remove approximately 100,000 cubic yards of sediment from the forebay and upper reaches of the main lake, install structural improvements within the forebay to facilitate sediment collection, establish new shoreline protection along the upper lake, and deposit the sediment off-site. In addition to restoring the Lake for recreational use, a major objective for the dredging project is to assess the present and future function and management of the lake for flood control, stormwater management, sediment and erosion control, and downstream water quality.

Project Status: This project is being designed as part of the Pollution Prevention and Pond Repairs level-of-effort project. A public meeting was held on September 25, 2007. Preliminary Engineering is scheduled to be presented to the Board on November 29, 2007.

The detailed design is currently under contract and construction is planned in FY11.

JUSTIFICATION

Sediment Study in 2000, conducted by the Park Development Division, determined the extent of siltation and costs for removal. This project was part of a 2005 functional plan for the lake's use as a recreational amenity, as well as lakeshore facilities. This project does not require a formal facility plan.

APPROPRIATION AND EXPENDITURE DATA

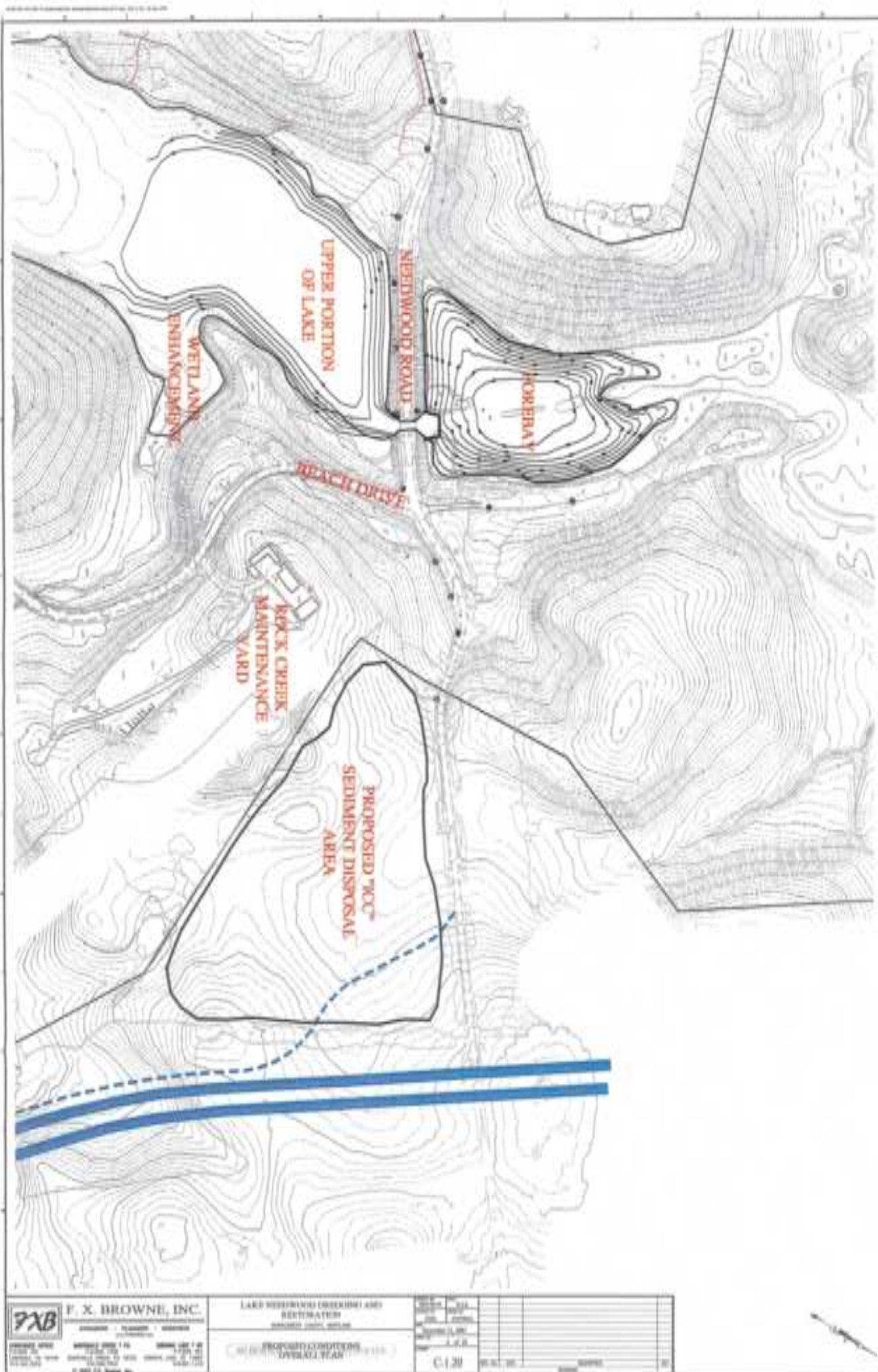
Date First Appropriation	FY	(\$000)
First Cost Estimate	FY09	3,695
Current Scope		
Last FY's Cost Estimate		0
Appropriation Request	FY09	0
Appropriation Request Est.	FY10	0
Supplemental Appropriation Request		0
Transfer		0
Cumulative Appropriation		0
Expenditures / Encumbrances		0
Unencumbered Balance		0
Partial Closeout Thru	FY06	0
New Partial Closeout	FY07	0
Total Partial Closeout		0

COORDINATION

Pollution Prevention and Pond Repairs PDF
 078701.

MAP

See Map on Next Page



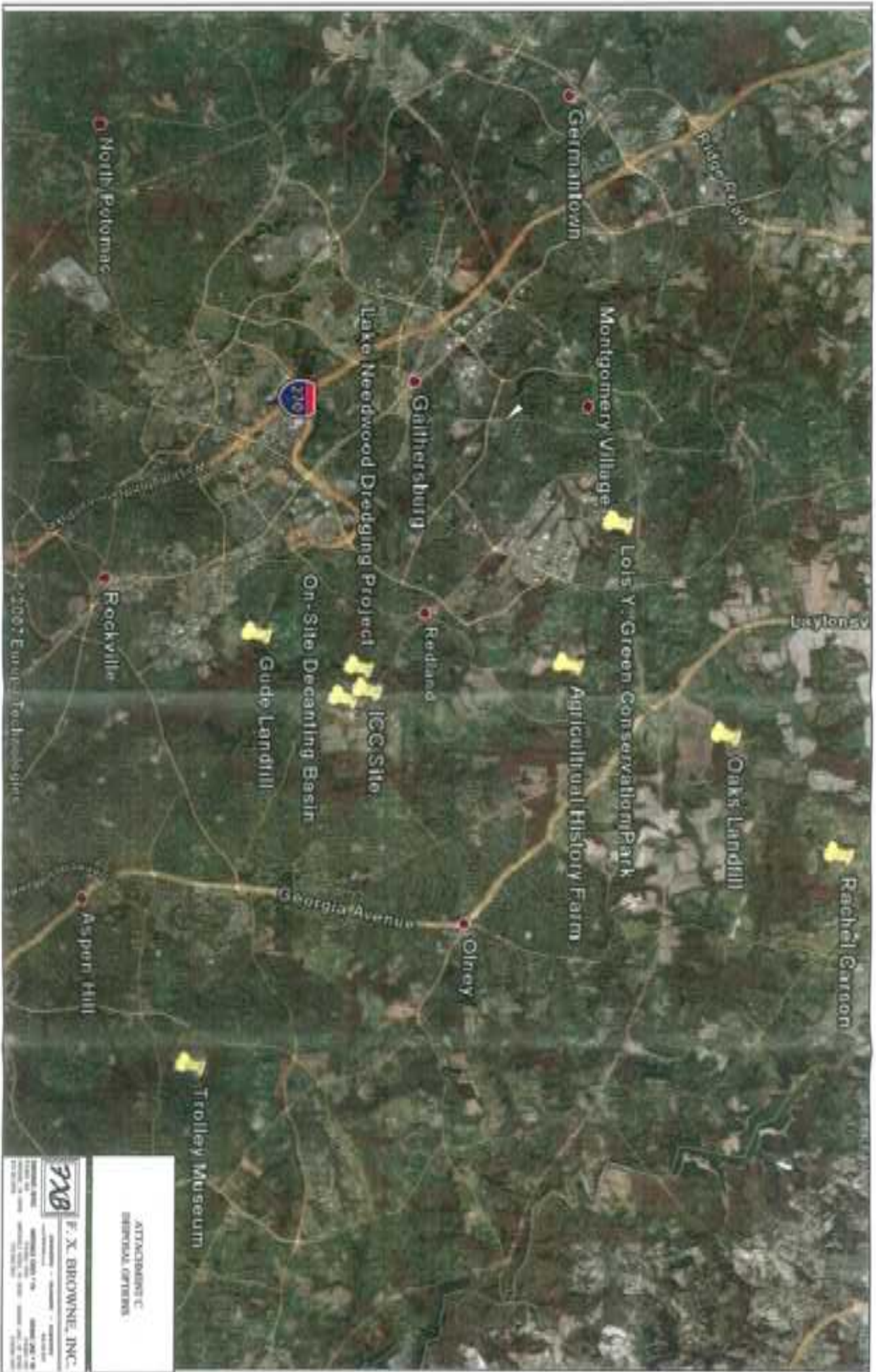
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**Lake Needwood Creek and
 Restoration**
 Sediment Disposal, Wetland
 Enhancement

PROJECT CONDITIONS
 1/1/2010

DATE: 1/1/2010
 SCALE: 1" = 100'
 SHEET: 1 OF 1
 C-120

NO.	DATE	DESCRIPTION
1	1/1/2010	ISSUED FOR PERMIT
2	1/1/2010	ISSUED FOR PERMIT
3	1/1/2010	ISSUED FOR PERMIT
4	1/1/2010	ISSUED FOR PERMIT
5	1/1/2010	ISSUED FOR PERMIT
6	1/1/2010	ISSUED FOR PERMIT
7	1/1/2010	ISSUED FOR PERMIT
8	1/1/2010	ISSUED FOR PERMIT
9	1/1/2010	ISSUED FOR PERMIT
10	1/1/2010	ISSUED FOR PERMIT



ATTACHMENT C
BIDDING FORM

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