



# *MILL WOODS SWIMMING POND DAM #1*

## VISUAL INSPECTION REPORT



Dam Name: Mill Woods Swimming Pond Dam #1  
CTDEEP ID#: 15906  
Owner: Town of Wethersfield  
Town: Wethersfield, Connecticut  
Consultant: GZA GeoEnvironmental, Inc.  
Date of Inspection: September 27, 2016





Proactive by Design

GEOTECHNICAL  
ENVIRONMENTAL  
ECOLOGICAL  
WATER  
CONSTRUCTION  
MANAGEMENT

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August 18, 2017  
GZA File No. 05.0045906.00

Mr. Derrick Gregor  
Town Engineer, Town of Wethersfield  
505 Silas Deane Highway  
Wethersfield, Connecticut 06109

Re: Visual Inspection Report  
Mill Woods Swimming Pond Dam #1  
CTDEEP # 15906

Dear Mr. Gregor:

In accordance with our proposal dated August 28, 2015 and our Notice to Proceed dated July 21, 2016 attached to the Town of Wethersfield Purchase Order Number: 20166877-000, GZA GeoEnvironmental, Inc. (GZA) has completed a visual inspection of the Mill Woods Swimming Pond Dam #1 located in Wethersfield, Connecticut.

Our site visit was performed on September 27, 2016 by Matthew A. Taylor, P.E., David M. Barstow, P.E., and Anthony Trani of GZA GeoEnvironmental, Inc. (GZA) as well as Don Moisa of Town of Wethersfield. At the time of the inspection, the weather was cloudy with a temperature of approximately 65° Fahrenheit.

The purpose of our efforts was to assess the current condition of the dam and to prepare an updated, formal Regulatory Inspection of the dam in accordance with the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) Dam Safety Regulation 22a-409, pertaining to inspection frequency. Our services and report are subject to the Limitations found in **Appendix D**.

Based on our visual inspection, the dam was found to be in **FAIR** condition. Refer to **Appendix A** for the condition rating definitions as per the Connecticut Dam Safety regulations. The deficiencies at the dam observed during the visual inspection include but are not limited to:

1. Brush growth and trees on the upstream and downstream slopes of the dam;
2. Disconnected joints in the left and right 3-foot-diameter outlet pipes for the primary spillway at the far downstream end of the pipes;
3. Damage to chain link fence, concrete spalling at the top of headwall and scour below the primary spillway outlet pipes; and
4. Possible need to increase the CT DEEP Hazard Classification for the dam.

Mill Woods Swimming Pond is filled for swimming use with chlorinated MDC water from a nearby fire hydrant. The pond is not directly connected to Mill Woods Park Pond and there is no natural watercourse entering the pond. Mill Woods Swimming Pond Dam #1 is currently classified by the CTDEEP as **Class A (Low) Hazard Potential**. However, Bell Pond Dam, which is a **Class BB (Moderate)**

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**Hazard Potential** dam, is located about 1,500 feet downstream from Mill Woods Swimming Pond Dam #1. According to the State of Connecticut Regulation of the Department of Environmental Protection concerning Dam Safety Inspection and Classification (Section 22a-409-2):

*"Where a dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of such dam shall be at least as great as that of the downstream dam".*

Based on a limited review of aerial photography and regional topographic information, it appears that a potential failure of Mill Woods Swimming Pond Dam #1 could potentially result in the "domino" failure of Bell Pond Dam. As such, it appears that Mill Woods Swimming Pond Dam #1 may need to be reclassified as a **Class BB (Moderate) Hazard Potential** dam. Further hydrologic and hydraulic analyses, including a dam breach analysis, are recommended herein to determine if the change in hazard class is warranted.

It is also critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can unsafe conditions be detected.

A further discussion of our evaluation and recommended actions are presented in the Inspection Report. The report includes: (a) CTDEEP Dam Inspection Form; (b) Limitations; and (c) Photo Log and Photo Location Plan.

We have appreciated the opportunity to have assisted you with this inspection. Please contact the undersigned if you have any questions or comments regarding the content of this Inspection Report.

Sincerely,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read "D. Barstow".

David M. Barstow, P.E.  
Project Manager

A handwritten signature in blue ink, appearing to read "Peter H. Baril".

Peter H. Baril, P.E.  
Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "M. Taylor".

Matthew A. Taylor, P.E.  
Principal-in-Charge

Enclosures:  
CTDEEP Dam Inspection Report Form

#### Appendices

- A. Overall Dam Condition Selection Standards
- B. Hazard Classification of Dams
- C. Photo Location Plan and Photo Log with Site Sketch
- D. Limitations



**Connecticut Department of  
Energy & Environmental Protection**  
Bureau of Water Protection & Land Reuse  
Inland Water Resources Division



## DAM SAFETY PROGRAM DAM INSPECTION REPORT FORM – FOR REGULATORY INSPECTION

Please complete this form in accordance with the instructions (DEEP-DAM-INST-002).

### Part I: Summary of Dam Inspection

Dam Name:	<b>Mill Woods Swimming Pond Dam #1</b>	Inspection Date(s):	<b>9/27/2016</b>
Alternate Dam Name(s):	<b>Mill Woods Dam #1</b>	CT Dam ID #:	<b>15906</b>
Location (Municipality):	<b>Wethersfield</b>	Temperature / Weather:	<b>~65°F /Cloudy</b>
Registered? Yes or No If yes, provide the 9 digit registration number found on the notification letter.	<b>Yes – Number Unknown</b>	Pool Level: See Instructions	<b>9.5-inches below primary spillway</b>
Emergency Action Plan?: Yes or No If Yes, see instructions	<b>No</b>	Impoundment Use: use options listed in instructions	<b>Recreation</b>
Hydraulic and Hydrologic Analysis?: Yes or No If Yes, see instructions	<b>No</b>	Stability Analysis?: Yes or No If Yes, see instructions	<b>No</b>
Overall Condition: (refer to <a href="#">Appendix A</a> located at the end of this form): <b>Fair</b>			

<b>Persons present at the inspection</b> <i>(select the tab button in the last cell to the right to create another row)</i>		
<b>Name</b>	<b>Title/Position</b>	<b>Representing</b>
<b>Matthew Taylor, P.E.</b>	<b>Associate Principal</b>	<b>GZA GeoEnvironmental, Inc.</b>
<b>David Barstow, P.E.</b>	<b>Project Manager</b>	<b>GZA GeoEnvironmental, Inc.</b>
<b>Anthony Trani</b>	<b>Assistant Project Manager</b>	<b>GZA GeoEnvironmental, Inc.</b>
<b>Don Moisa</b>	<b>Operations Coordinator</b>	<b>Town of Wethersfield</b>

**Owners and Operators:** If there is more than one owner or operator, copy the empty table below for each owner or operator and paste right below the previous table, then complete the information for each

\*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject report. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes by email via [deep.damsafety@ct.gov](mailto:deep.damsafety@ct.gov).

**Indicate if Owner or Operator: Owner**

**Name: Town of Wethersfield (Contact: Jeff Bridges, Town Manager)**

**Mailing Address: 505 Silas Deane Highway**

**City/Town: Wethersfield**

**State: CT**

**Zip Code: 06109**

**Phone: (860) 721-2801**

**ext.: ---**

**Emergency Phone: ---**

**\*E-mail: [jeff.bridges@wethersfieldct.gov](mailto:jeff.bridges@wethersfieldct.gov)**

**Part II: General Dam Information**

**General Description:** The Mill Wood Swimming Pond is used for recreation. The Mill Woods Swimming Pond Dam #1 consists of an approximate 275-foot-long earthen embankment located on the northeastern side of the impoundment. Existing topography serve as the left and right abutments. The dam crest is asphalt-paved and is used as an access road for Mill Woods Park.

The primary spillway is a drop inlet with a broad crested weir. The top of the spillway is separated into 5 sections by 15-inch-wide concrete beams. Four weir/bays are 5-feet-wide and one weir section (left side) is 6-feet-wide. There are trash grates over each of the 5 bays/sections. Three reinforced concrete pipes (RCP) serve as the outlet from the primary drop inlet structure. The pipes are 3-, 4-, and 3-foot-diameter, respectively and extend from the drop inlet structures, through the embankment. Water from the spillway discharges to a downstream channel that leads to Goff Brook and ultimately to Bell Pond (refer to Figure 3). The RCP outlet pipes discharge from an approximately 40-foot-long, reinforced concrete head wall on the downstream side of the embankment. There is an approximately 75-foot-long, concrete masonry training wall on the left side of the spillway. There also is a 6-inch-diameter ductile iron (DI) pipe with a gate valve which is accessed from inside the drop inlet structure. The pipe inlet was reported by a Town of Wethersfield maintenance worker to be plugged with concrete.

The auxiliary spillway is located approximately 20-feet south of the primary spillway and consists of an estimated 2-foot-wide by 6-foot-long drop inlet structure. There is a trash rack over the top of the intake. The inside of the drop inlet structure could not be accessed at the time of the inspection because it is located upstream of the dam, within the pond without a bridge or walkway to it. A low-level outlet pipe with a gate valve was described by the Town of Wethersfield. The 8-inch-diameter, ductile iron pipe and valve are accessed from inside the drop inlet structure. The auxiliary spillway flow travels through a 24-inch-diameter RCP pipe that also extends through the embankment and discharges to the same downstream channel as the primary spillway.

The Town of Wethersfield coordinates with CTDEEP to drain and refill the pond each spring with chlorinated MDC water from a nearby fire hydrant for swimming use.

<b>Hazard Classification:</b>	A	<b>Dam Height (ft):</b>	8
<b>Dam Length (ft):</b>	Approx. 275	<b>Spillway Length (ft):</b>	Primary – 26 Auxiliary – 2-foot-wide by 6-foot-long drop inlet (estimated)
<b>Spillway Type:</b>	Primary – Drop inlet with a broad crested weir Auxiliary – Drop inlet spillway	<b>Normal Freeboard (ft):</b>	2
<b>Drainage Area (square miles):</b>	0.006 (4-acres)	<b>Impoundment Area (at principal spillway crest, in acres):</b>	2
<b>Watercourse(s):</b> Mill Woods Swimming Pond is filled for swimming use with chlorinated MDC water from a nearby fire hydrant. The pond is not directly connected to Mill Woods Park Pond and there is no natural watercourse entering the pond. Spillways discharge to a channel which flows to Goff Brook.			

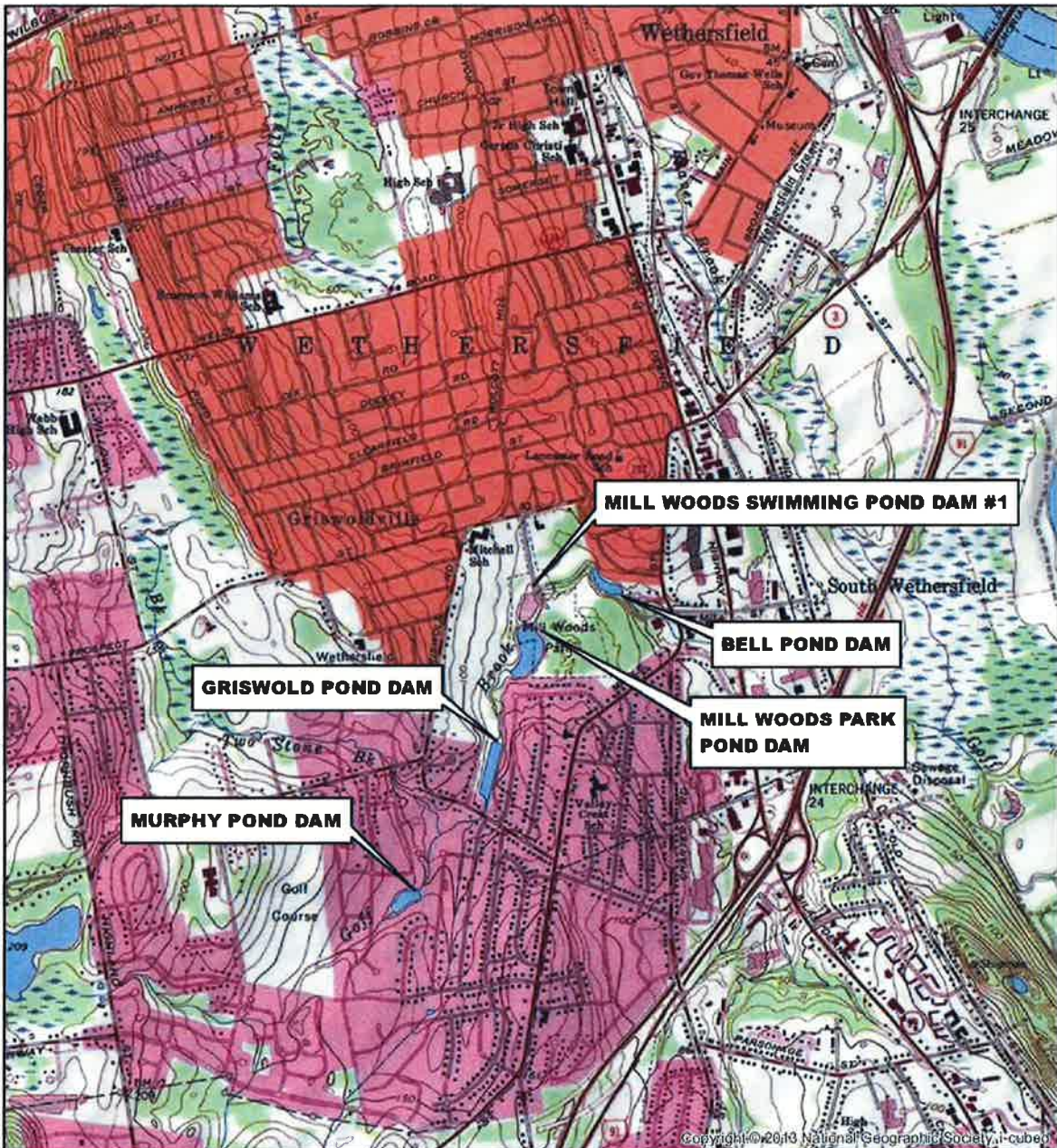
**OTHER INFORMATION:**




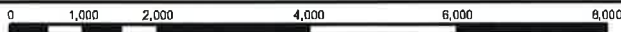
The information presented in the table above was obtained from a CTDEEP Dam Registration Form and from direct observation.

A series of six (6) dams are located on the upper watershed of Goff Brook. The dams, listed in descending order from upstream to downstream, are: 1860 Reservoir Dam (Hazard Class A), Murphy Pond Dam (Hazard Class A), Griswold Pond Dam (Hazard Class A), Mill Woods Park Pond Dam (Hazard Class A), Mill Woods Swimming Pond Dam #1 (Hazard Class A) and Bell Pond Dam (Hazard Class BB). The Town of Wethersfield is the owner/operator for each of these dams.

According to documents available at the Connecticut Department of Energy and Environmental Protection (CTDEEP), the dam was first constructed as a temporary dam in 1944. The Mill Wood Swimming Pond Dam #1 was originally constructed as a wooden bulkhead used to elevate the water level for the swimming pool. Water discharged through one (1) 48-inch-diameter and two (2) 36-inch-diameter RCP pipes with a combined capacity of 416 cubic feet per second. The wooden bulkhead was later removed and replaced with reinforced concrete. The available documents do not state when the wooden bulkhead was removed or when the current primary drop inlet structure, auxiliary drop inlet structure and embankment were constructed.

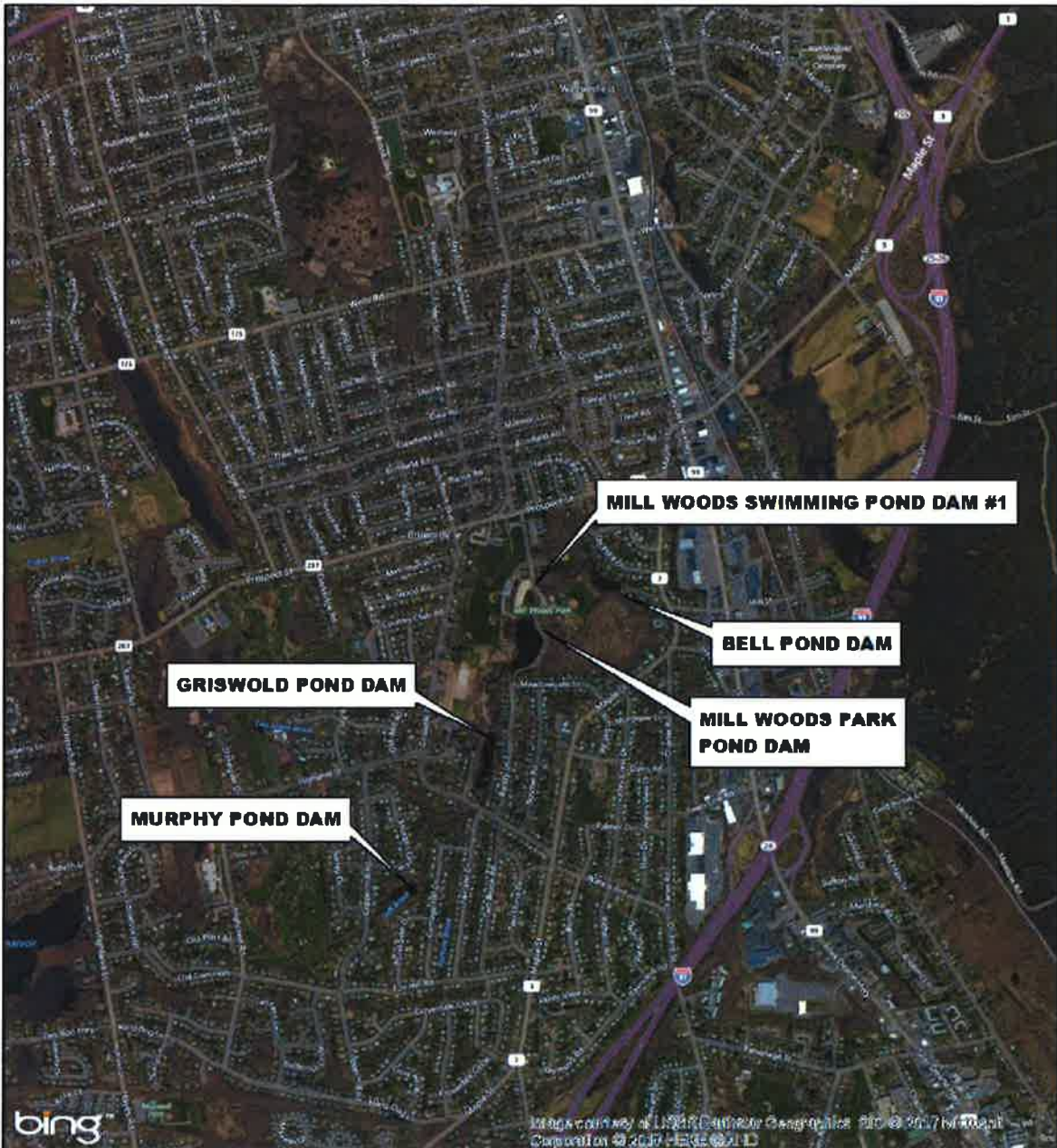





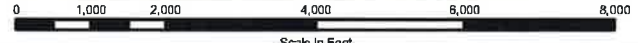


 <p>GZA GeoEnvironmental, Inc.                  Engineers and Scientists                  www.gza.com</p>  <p>USGS 7.5 MINUTE                  QUADRANGLE BASE MAP                  HARTFORD SOUTH, CONNECTICUT                  1999</p>	<b>MILL WOODS SWIMMING POND DAM #1</b> LOCUS		N 	
	WETHERSFIELD, CONNECTICUT			
	Source: TOPOI maps are USGS topographic maps, Copyright© 2011 National Geographic Society, i-cubed and are provided by arcgisonline.com.			
	PROJ MGR: DMB	REVIEWED BY: MAT		PROJECT NO. 05.0045906.00
	DESIGNED BY: AJT	DRAWN BY: MJS		DATE: SEPTEMBER 2016
THIS MAP HAS BEEN COMPILED FROM OTHER MAPS AND/OR SOURCES OF INFORMATION. THIS MAP SHOULD NOT BE CONSTRUED AS A PROPERTY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.			<b>FIGURE</b> <b>1</b>	
 Scale in Feet				

© 2017 - GZA GeoEnvironmental, Inc. J:\\_45,500-46,990\46906.n06 Town of Wethersfield\46906-00.dmb\GIS\mxd\LOCUS MW SWIM PND 1.mxd, 4/26/2017, 12:46:12 PM, max.stubel





 <p>GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>  <p>USGS 7.5 MINUTE QUADRANGLE 9 BASE MAP: HARTFORD SOUTH, CONNECTICUT 1097</p>	<p><b>MILL WOODS SWIMMING POND DAM #1</b> <b>AERIAL PHOTOGRAPH</b></p>		<p>N</p> 
	<p>WETHERSFIELD, CONNECTICUT</p>		
	<p>Source: Imagery provided by arcgisonline.com.</p>		
	<p>PROJ MGR: DMB</p>	<p>REVIEWED BY: MAT</p>	
<p>DESIGNED BY: AJT</p>	<p>DRAWN BY: MJS</p>	<p>DATE: SEPTEMBER 2016</p>	
<p><small>THIS MAP HAS BEEN COMPILED FROM OTHER MAPS AND/OR SOURCES OF INFORMATION. THIS MAP SHOULD NOT BE CONSTRUED AS A PROPERTY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.</small></p>			<p>FIGURE <b>2</b></p>
 <p>Scale in Feet</p>			

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**Part IV: Dam/Embankment/Dike Information**

Number of Dam/Embankments/Dikes: (1) One

**Dam/Embankment/Dike Name (see instructions):** Mill Woods Swimming Pond Dam #1

**General Description:** The dam consists of an approximately 275-foot-long earthen embankment with a primary, drop inlet spillway located near middle of the dam. The crest of the dam is a paved park access road (about 40- to 50-feet wide). Existing topography functions as the left and right abutments. The upstream slope of the embankment varies from 3 horizontal to 1 vertical (3H:1V) to 5H:1V. The downstream slope of the embankment varies from 3H:1V to 4H:1V.

**General Condition:** Poor – due to the tree growth

**Concrete Condition:** N/A

**Stone Masonry:** N/A

**Settlement/Alignment/Movement:** Occasional cracks were observed in the asphalt road on the crest of the embankment.

**Seepage/Foundation Drainage:** None observed. Downstream slope was heavily vegetated with brush and mature trees. Vision was obscured.

**Riprap:** Riprap was observed along the toe of the upstream slope along the water line to the right of the spillway.

**Erosion/Burrows:** None observed – Vision was obscured by heavy brush on the downstream slope.

**Vegetative Cover:** Left of the spillway, the upstream embankment slope is covered with maintained grass. Right of the spillway, the upstream embankment slope has maintained grass near the crest and transitions to thick brush near the toe of slope along the water line. The downstream slope is covered in thick brush and mature trees.

**Other:** A chain link fence with a locking gate was observed on the upstream side of the dam crest. The primary drop inlet spillway is accessed through this locking gate. Four PVC pipes were observed on the crest of the dam to the right of the spillway. These pipes are used for the fire department to test their fire trucks. According to the Don Moisa (Wethersfield Operations Coordinator), the impoundment overtops the road near the right abutment during heavy rain events.

**Photos/Graphics/Sketches:** See Parts XIII and XIV below.

**Part V: Principal Spillway, Training Walls, Apron**

Number of Principal Spillways: (1) One

**Spillway Type (see instructions):** Drop inlet structure with broad crested weir

**General Description:** The primary spillway is a drop inlet with a broad crested weir. The broad crested weir is located on the upstream side of the drop inlet structure. The spillway is separated into 5 sections by 15-inch-wide concrete beams. Four weir sections are 5-feet-wide and one weir section (left side) is 6-feet-wide. There are steel grate trash racks on the drop inlet structure. The drop inlet structure is approximately 8-feet-deep. There is an approximately 75-foot-long, concrete masonry training wall on the left side of the spillway.

**General Condition:** Fair

**Concrete Condition:** Fair

**Stone Masonry:** N/A

**Settlement/Alignment/Movement:** None observed

**Cracks:** Minor spalling, efflorescence and cracking were observed in the drop inlet structure interior above the outlet pipes. Exposed aggregate was observed on the upstream face at the water line.

**Scouring/Undermining:** None observed

**Seepage/Foundation Drainage:** None observed

**Other:** Several bricks were observed on the bottom of the drop inlet structure.

**Photos/Graphics/Sketches:** See Parts XIII and XIV below.

**Part VI: Auxiliary Spillway, Training Walls, Apron****Number of Auxiliary Spillways:** (1) One**Auxiliary Spillway Type (see instructions):** Drop inlet structure**General Description:** The auxiliary spillway is approximately 20-feet to the right of the primary spillway in the impoundment and is an estimated 2-foot-wide by 6-foot-long drop inlet structure. There is a trash rack over the top. The auxiliary spillway discharges through a 24-inch-diameter RCP pipe which leads into the channel that connects to Goff Brook. A low-level outlet pipe with a gate valve was described by the Town of Wethersfield. The gate valve is accessed from inside the drop inlet structure.**General Condition:** Unknown –the auxiliary spillway is located in the pond and could not be accessed.**Concrete Condition:** Due to the location of the auxiliary spillway, it could not only be observed from the shore.**Stone Masonry:** N/A**Settlement/Alignment/Movement:** None observed - Due to the location of the auxiliary spillway, it could not only be observed from the shore.**Cracks:** None observed - Due to the location of the auxiliary spillway, it could not only be observed from the shore.**Scouring/Undermining:** None observed - Due to the location of the auxiliary spillway it could not only be observed from the shore.**Vegetative Cover:** none observed**Riprap:** N/A**Seepage/Foundation Drainage:** N/A**Other:** N/A**Photos/Graphics/Sketches:** See Parts XIII and XIV below.**Part VII: Downstream Channel****Number of Downstream Channels:** (1) One**Channel Name (see instructions), include Watercourse Name:** Channel connecting to Goff Brook.**General Description:** The downstream channel consists natural channel which connects to Goff Brook. Riprap was observed immediately downstream of the outlet pipes. No riprap was observed further away from the outlet pipes.**General Condition:** Good**Scouring:** None observed**Debris:** None observed**Riprap:** Riprap between 6- and 24-inches was observed within the downstream channel near the outlet pipes.**Other:** N/A**Photos/Graphics/Sketches:** See Parts XIII and XIV below.**Part VIII: Intake Structure(s)****Number of Intake Structures:** (1) One**Intake Structure Type (see instructions):** Pipe leading from the auxiliary drop inlet structure**General Description:** The auxiliary spillway is approximately 20-feet to the right of the primary spillway in the impoundment. The drop inlet structure is an estimated 2-foot-wide by 6-foot-long. According to the Town of Wethersfield, the low-level intake structure consists of an 8-inch-diameter, ductile iron pipe with a gate valve located in the drop inlet structure. The inlet is located approximately 2 feet to the left of the auxiliary drop inlet structure and consists of an 18-inch diameter cast iron drain with a drain grate.**General Condition:** The auxiliary spillway is located in the impoundment and could not be observed from shore.**Concrete Condition:** The auxiliary spillway is located in the impoundment and could not be observed from shore**Stone Masonry:** N/A

**Settlement/Alignment/Movement:** The auxiliary spillway is located in the impoundment and could not be observed from shore

**Cracks:** None observed

**Other:** N/A

**Photos/Graphics/Sketches:** See Parts XIII and XIV below.

## Part IX: Outlet Structure(s)

**Number of Outlet Structures:** (2) Two

**Outlet Structure Type (see instructions):** Primary spillway headwall and outlet pipes

**General Description:** Three reinforced concrete pipes (RCP) serve as the outlet from the primary spillway drop inlet structure. The pipes are 3-, 4-, and 3-foot-diameter, respectively. The three RCP outlet pipes discharge into a channel that leads to Goff Brook (downstream channel). The RCP outlet pipes discharge from an approximately 40-foot-long, reinforced concrete head wall. There is a concrete apron downstream at the toe of the headwall. There is a 6-inch-diameter ductile iron (DI) outlet pipe with a gate valve which is accessed from inside the primary drop inlet structure. The pipe inlet is in the drop inlet structure and the discharge location of the pipe is unknown.

**General Condition:** Poor

**Concrete Condition:** Spalling (up to 2 inches) was observed on the top of the concrete headwall.

**Stone Masonry:** N/A

**Settlement/Alignment/Movement:** The left and right side 3-foot-diameter RCP pipes had disconnected joints (offset up to 4-inches) about 4 feet from the headwall.

**Scouring/Undermining:** Up to 3-inches of spalling/scour was observed below each of the RCP pipes on the headwall.

**Other:** The concrete headwall has a chain link fence at the top. The fence is in poor condition.

**Photos/Graphics/Sketches:** See Parts XIII and XIV below.

**Outlet Structure Type (see instructions):** Auxiliary spillway pipe

**General Description:** The auxiliary spillway outlet pipe consists of a 24-inch-diameter RCP pipe that discharges to the right of the primary spillway outlet downstream channel.

**General Condition:** Fair.

**Concrete Condition:** Minor spalling at the discharge to the downstream channel.

**Stone Masonry:** N/A

**Settlement/Alignment/Movement:** None observed

**Scouring/Undermining:** None observed.

**Other:** N/A

**Photos/Graphics/Sketches:** See Parts XIII and XIV below.

## Part X: Miscellaneous Feature

**List miscellaneous features:** Mill Woods Swimming Pond Dam #1 is located in Mill Woods Park which is on the south side of Prospect Street. The dam is accessed via an access road to the park. The Town of Wethersfield coordinates with CTDEEP to drain and refill the pond each spring with chlorinated MDC water from a nearby fire hydrant for swimming use.

**Photos/Graphics/Sketches:** See Parts XIII and XIV below.



## Part XI: Downstream Hazard Classification Reassessment

**Downstream Hazard Classification:** *(provide recommendation for the hazard class based on the Dam Safety regulation. See Instructions and Appendix B.)*

Mill Woods Swimming Pond Dam #1 is currently classified by the Connecticut Department of Energy and Environmental Protection (CTDEEP) as **Class A (Low) Hazard Potential**. However, Bell Pond Dam, which is a **Class BB (Moderate) Hazard Potential** dam, is located about 1,500 feet downstream from Mill Woods Swimming Pond Dam #1. According to the State of Connecticut Regulation of the Department of Environmental Protection concerning Dam Safety Inspection and Classification (Section 22a-409-2):

*"Where a dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of such dam shall be at least as great as that of the downstream dam".*

Based on a limited review of aerial photography and regional topographic information, it appears that a potential failure of Mill Woods Swimming Pond Dam #1 could potentially result in the "domino" failure of Bell Pond Dam. As such, it appears that Mill Woods Swimming Pond Dam #1 may need to be reclassified as a **Class BB (Moderate) Hazard Potential** dam. Further hydrologic and hydraulic analyses are recommended herein to determine if the change in hazard class is warranted.

## Part XII: Recommendations *(See instructions for identifying recommendations)*

**Recommendations:** The following recommendations and remedial measures generally describe the recommended approach to address the current deficiencies at the dam. Prior to undertaking any maintenance, repairs or remedial measures, the applicability of dam safety and environmental permits should be considered.

### Studies and Analyses:

1. Perform a hydrologic and hydraulic (H&H) analysis to determine the appropriate spillway design flood, evaluate spillway capacity, and evaluate anticipated overtopping depths. Since the Town has observed overtopping in the past, evaluate options to either: increase hydraulic capacity of the dam, harden the embankment to withstand overtopping, or develop an operations procedure that includes draining the impoundment prior to flooding events to mitigate overtopping potential.
2. Perform a dam breach analysis to determine if the failure of Mill Woods Swimming Pond Dam #1 would result in the overtopping and failure of the downstream Bell Pond Dam. Adjust the hazard class of Mill Woods Swimming Pond Dam #1 accordingly.
3. Conduct investigations into the operability and accessibility of the low-level outlet gate valve in the auxiliary drop inlet structure; make repairs/replacements as necessary.

### Recurrent Maintenance Recommendations:

GZA recommends the following recurrent maintenance-level activities that can be undertaken by Owner and do not require engineering design or a dam safety permit.

1. Cut and maintain the vegetation/brush on the embankment (upstream and downstream slopes).

Dam Repairs

GZA recommends the following repairs that can be undertaken by the Owner and requires Professional Engineer oversight and a dam safety permit.

1. Remove trees including root balls on upstream slopes, downstream slopes, and within 25 feet of the dam. Fill, compact, seed and maintain grass upon completion.
2. Repair disconnected joints in the left and right 3-foot-diameter outlet pipes for the primary spillway.

GZA recommends the following repairs that can be undertaken by the Owner and do not require engineering design or a dam safety permit.

1. Repair the chain link fence, concrete spalling at the top of headwall and scour below the primary spillway outlet pipes.

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**Part XIII: Photographs/Graphics** (see instructions and [Appendix C](#))

Refer to Appendix C for Photographic Log

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**Part XIV: Sketches**

Refer to Appendix C for a Site Sketch

**Part XV: Professional Engineer Certification**

The following certification must be signed by a Professional Engineer

"I hereby certify that the information provided in this report has been examined by me and found to be true and correct in my professional judgment."



9/27/16

Signature of Professional Engineer

Date

**Matthew A. Taylor**

**Associate Principal**

**26480**

Printed Name of Professional Engineer

Title

CT P.E. Number

GZA GeoEnvironmental, Inc  
Name of Firm

Affix P.E. Stamp Here



**Part XVI: Owner Signature**

The following statement must be signed by the Owner(s) of the subject Dam.

"The information provided in this report has been examined by me."	
	7/31/2017
Signature of Owner	Date
Jeff Bridges (Town of Wethersfield)	Town Manager
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)

**Note: Mail the completed inspection report to:**

**DAM SAFETY PROGRAM**  
**INLAND WATER RESOURCES DIVISION**  
**CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION**  
**79 ELM STREET**  
**HARTFORD, CT 06106**

In addition, please send this completed report converted to Adobe portable document format (pdf) including a scan of the signature page via email to: [DEEP.DamSafety@ct.gov](mailto:DEEP.DamSafety@ct.gov)



**APPENDIX A**

**OVERALL DAM CONDITION SELECTION STANDARDS**

## Appendix A: Overall Dam Condition Selection Standards

Condition	Definition
<b>Good</b>	Through file research and after a thorough visual inspection it has been determined that the dam is well maintained and no existing dam safety deficiencies are recognized. Only continued routine maintenance is required.
<b>Satisfactory</b>	Through file research and after a thorough visual inspection it has been determined that no significant deficiencies are recognized. Only minor maintenance is required and only minor flaws are noted.
<b>Fair</b>	Through file research and after a thorough visual inspection it has been determined that there are no critical deficiencies with the dam that would require engineering analysis with the following exception: the engineer may recommend that a hydrologic and hydraulic analysis be conducted due to the lack of adequate freeboard and/or the lack of spillway capacity documentation. A condition exists at the dam that may require some sort of additional monitoring.
<b>Poor</b>	Through file research and after a thorough visual inspection it has been determined that deficiencies are recognized that require engineering analysis and/or remedial action.
<b>Unsatisfactory</b>	Through file research and after a thorough visual inspection it has been determined that a deficiency is recognized that requires immediate or emergency action. Administrative/Enforcement action may be required as determined by the Dam Safety Program. Reservoir level restrictions may be necessary until the problem is resolved.

**APPENDIX B**

**HAZARD CLASSIFICATION OF DAMS**

## Appendix B - Hazard Classification of Dams

- I. A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:**
- (i) no measurable damage to roadways;
  - (ii) no measurable damage to land and structures;
  - (iii) negligible economic loss.
- II. A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) damage to agricultural land;
  - (ii) damage to unimproved roadways (less than 100 ADT);
  - (iii) minimal economic loss.
- III. A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) damage to normally unoccupied storage structures;
  - (ii) damage to low volume roadways (less than 500 ADT);
  - (iii) moderate economic loss.
- IV. A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) possible loss of life;
  - (ii) minor damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
  - (iii) damage to or interruption of the use of service of utilities;
  - (iv) damage to primary roadways (less than 1500 ADT) and railroads;
  - (v) significant economic loss.
- V. A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) probable loss of life;
  - (ii) major damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
  - (iii) damage to main highways (greater than 1500 ADT);
  - (iv) great economic loss.



**APPENDIX C**

**PHOTO LOCATION PLAN AND PHOTO LOG WITH SITE SKETCH**









<b>Client Name:</b> Town of Wethersfield	<b>Site Location:</b> Mill Woods Swimming Pond Dam #1, Wethersfield, CT	<b>Project No.:</b> 05.0045906.00
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<b>Photo No.:</b> 01	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Northerly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b> Overview of dam from upstream.	



<b>Photo No.:</b> 02	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Northerly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b> Overview of reservoir area from upstream beach area located left of the primary spillway.	





**Client Name:**  
Town of Wethersfield

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Mill Woods Swimming Pond Dam #1, Wethersfield, CT

**Project No.:**  
05.0045906.00

<b>Photo No.:</b> 03	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Northwesterly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b>  Overview of upstream face and crest of embankment from right abutment. Note vegetation and brush on upstream face.	



<b>Photo No.:</b> 04	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Northwesterly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b>  Overview of upstream embankment slope looking towards the left abutment and spillway training wall.	







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**Project No.:**  
05.0045906.00

<b>Photo No.:</b> 05	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Southerly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b> Overview of downstream embankment slope. Note thick brush and mature trees on slope.	



<b>Photo No.:</b> 06	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Northerly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b> Overview of downstream embankment slope looking towards the left abutment.	







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**Project No.:**  
05.0045906.00

<b>Photo No.:</b> 07	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Northerly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b>  Overview of primary spillway from the embankment. The white PVC pipe to the left is a filter for the pond.	




<b>Photo No.:</b> 08	<b>Date:</b> 9/27/16
<b>Direction Photo Taken:</b> Westerly	
<b>Photographer:</b> D. Barstow	
<b>Description:</b>  Overview of primary spillway and approach area from the dam crest.	





<b>Client Name:</b> Town of Wethersfield	<b>Site Location:</b> Mill Woods Swimming Pond Dam #1, Wethersfield, CT	<b>Project No.:</b> 05.0045906.00
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<b>Photo No.:</b> 09	<b>Date:</b> 9/27/16	
<b>Direction Photo Taken:</b> Southerly		
<b>Photographer:</b> D. Barstow		
<b>Description:</b> Overview of the auxiliary spillway from the primary spillway.		

<b>Photo No.:</b> 10	<b>Date:</b> 9/27/16	
<b>Direction Photo Taken:</b> Northerly		
<b>Photographer:</b> D. Barstow		
<b>Description:</b> Overview of training wall located left of the primary spillway		





**Client Name:**  
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**Project No.:**  
05.0045906.00

**Photo No.:**  
11

**Date:**  
9/27/16

**Direction Photo Taken:**  
Westerly

**Photographer:**  
D. Barstow

**Description:**

Overview of bottom of primary drop inlet structure and ductile iron outlet from downstream headwall. Note brick debris on the bottom of the drop inlet structure.



**Photo No.:**  
12

**Date:**  
9/27/16

**Direction Photo Taken:**  
Easterly

**Photographer:**  
D. Barstow

**Description:**

Downstream headwall and central 42-inch-diameter RCP outlet pipe in the primary drop inlet structure. Note minor spalling, minor cracking, and very minor efflorescence on headwall.





**Client Name:**

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**Site Location:**

Mill Woods Swimming Pond Dam #1, Wethersfield, CT

**Project No.:**

05.0045906.00

**Photo No.:**

13

**Date:**

9/27/16

**Direction Photo Taken:**

Easterly

**Photographer:**

D. Barstow

**Description:**

Overview of downstream channel at the convergence of Goff Brook and Mill Woods Swimming Pond Dam #1 discharge channel looking downstream.



**Photo No.:**

14

**Date:**

9/27/16

**Direction Photo Taken:**

Westerly

**Photographer:**

D. Barstow

**Description:**

Overview of auxiliary spillway outlet pipe (left) and primary spillway outlet pipes and headwall (right).



Auxiliary Spillway Outlet

Primary Spillway Outlets





**Client Name:**  
Town of Wethersfield

**Site Location:**  
Mill Woods Swimming Pond Dam #1, Wethersfield, CT

**Project No.:**  
05.0045906.00

**Photo No.:**  
15

**Date:**  
9/27/16

**Direction Photo Taken:**  
Northwesterly

**Photographer:**  
D. Barstow

**Description:**

Overview of primary spillway outlet pipes. Note exposed aggregate and spalling on headwall.



**Photo No.:**  
16

**Date:**  
9/27/16

**Direction Photo Taken:**  
Westerly

**Photographer:**  
D. Barstow

**Description:**

Concrete spalling and erosion of headwall at central outlet pipe discharge to downstream channel.





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**Project No.:**  
05.0045906.00

**Photo No.:**  
17

**Date:**  
9/27/16

**Direction Photo Taken:**  
Westerly

**Photographer:**  
D. Barstow

**Description:**

Disconnected joints were observed in the left and right 3-foot-diameter RCP outlet pipes from the primary spillway. Disconnected joint (offset up to 4-inches) was observed about 4 feet from the pipe discharge.





**APPENDIX D**

**LIMITATIONS**



## USE OF REPORT

1. GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of the Town of Wethersfield (Client) for Millwoods Park Swimming Pond Dam and for the stated purpose(s) and location(s) identified in the Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

## STANDARD OF CARE

2. Our findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. Our services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

## SUBSURFACE CONDITIONS

4. If presented, the generalized soil profile(s) and description, along with the conclusions and recommendations provided in our Report, are based in part on widely-spaced subsurface explorations by GZA and/or others, with a limited number of soil and/or rock samples and groundwater /piezometers data and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
5. Water level readings have been made in test holes (as described in the Report), monitoring wells and piezometers, at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the groundwater and piezometer levels, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, reservoir and tailwater levels, the presence of subsurface utilities, and/or natural or artificially induced perturbations.

## GENERAL

6. The observations described in this report were made under the conditions stated therein. The conclusions presented were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.
7. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein available to GZA at the time of the evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.



8. Any GZA hydrologic analysis presented herein is for the rainfall volumes and distributions stated herein. For storm conditions other than those analyzed, the response of the site's spillway, impoundment, and drainage network has not been evaluated.
9. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the structure or site, or to structures on the site was unavailable or limited, GZA renders no opinion as to the condition of that portion of the site or structure. In particular, it is noted that water levels in the impoundment and elsewhere and/or flow over the spillway may have limited GZA's ability to make observations of underwater portions of the structure. Excessive vegetation, when present, also inhibits observations.
10. In reviewing this Report, it should be realized that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued inspection and care can there be any chance that unsafe conditions be detected.

#### **COMPLIANCE WITH CODES AND REGULATIONS**

11. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.
12. This scope of work does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

#### **COST ESTIMATES**

13. Unless otherwise stated, our cost estimates are for comparative, or general planning purposes. These estimates may involve approximate quantity evaluations and may not be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over the labor and material costs required to plan and execute the anticipated work, our estimates were made using our experience and readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

#### **ADDITIONAL SERVICES**

14. It is recommended that GZA be retained to provide services during any future: site observations, explorations, evaluations, design, implementation activities, construction and/or implementation of remedial measures recommended in this Report. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.