



– GRISWOLD POND DAM –
VISUAL INSPECTION REPORT



Dam Name: Griswold Pond Dam

CTDEEP ID#: 15904

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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July 27, 2017
GZA File No. 05.0045906.00

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

Re: Visual Inspection Report
Griswold Pond Dam
CTDEEP # 15904

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 Griswold Pond Dam 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 Mr. 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 **POOR** 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. Seepage at the previous repairs at the spillway contact with the embankment and at the joint between Spillway Section A and Section B;
2. Apparent outward rotation of the Spillway Section B and separation between Spillway Section A and Section B;
3. Erosion of the embankment at the right abutment contact;
4. Seepage through and deterioration of the stop logs;
5. Brush and woody debris dumped on the downstream embankment slope; and
6. Brush growth and trees on the crest and upstream and downstream slopes of the embankment.

Griswold Pond Dam is currently classified by the Connecticut Department of Energy and Environmental Protection (CTDEEP) as **Class A (Low) Hazard Potential**. However, Mill Wood Park Pond Dam (**Hazard Class A**) is located approximately 1,800 feet downstream of Griswold Pond Dam and Bell Pond Dam, which is a **Class BB (Moderate) Hazard Potential** dam, is located about 3,600



feet downstream from Griswold Pond Dam. 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 Griswold Pond Dam could potentially result in the “domino” failure of Mill Woods Park Pond Dam and possibly Bell Pond Dam. As such, it appears that Griswold Pond Dam 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.

It should be noted that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. Impoundment levels greater than or lower than the time of inspection may create conditions which were undetectable during this visual inspection. The condition of the dam reported herein is based on observations of field conditions at the time of inspection and the data available to the inspection team. 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.

GZA GeoEnvironmental, Inc. will submit one bound color copy of the final inspection report to the Inland Water Resources Division of CTDEEP. An electronic copy of the complete report in unlocked, searchable PDF format, using the latest CTDEEP prescribed format will also be sent to the CTDEEP.

We are happy to have been able to assist 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.
Sr. 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 "Matthew A. 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
- E. Historic Drawings



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:	Griswold Pond Dam	Inspection Date(s):	9/27/2016
Alternate Dam Name(s):	---	CT Dam ID #:	15904
Location (Municipality):	Wethersfield	Temperature / Weather:	~65°F /Cloudy
Registered?: Yes or No If yes, provide the 9 digit registration number found on the notification letter.	Yes – Number Unknown	Pool Level: See Instructions	0.1 feet below principal spillway crest
Emergency Action Plan?: Yes or No If Yes, see instructions	No	Impoundment Use: use options listed in instructions	Recreation
Hydraulic and Hydrologic Analysis?: Yes or No If Yes, see instructions	No	Stability Analysis?: Yes or No If Yes, see instructions	No
Overall Condition: (refer to Appendix A located at the end of this form) Poor			

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

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.

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

Part II: General Dam Information

General Description: Griswold Pond Dam is an earthen embankment dam with a maximum height of about 8.3+/- feet and a total length of approximately 170 feet. Existing topography serve as the abutments for the dam. The crest of the dam is estimated to be about 20 to 30 feet wide and is covered with thick brush and vegetation. The upstream and downstream embankment slopes are also covered with thick brush and mature trees. The embankment slopes are estimated to range from about 2 horizontal to 1 vertical (2H:1V) to 4H:1V.

The spillway is located near the right abutment contact and consists of two adjoining sections. The central spillway section (Section A) is a 25-foot long, reinforced concrete, broad-crested weir with two notched bays with stop logs. The section nearest the right abutment (Section B) is a 24-foot long, reinforced concrete, broad-crested weir. The embankment at the contact with the left side of Section A and the embankment at the contact with the right side of Section B have been repaired with grouted riprap and grout-filled fabric bags. The top of the embankment repairs appear to be at the same elevation as the spillway sections. The embankment repair located to the left of Section A extends parallel with the main axis of the dam and the spillway and essentially increases the total spillway length by about 10 to 15 feet.

Water discharges over the spillway (Section A and Section B) into a riprap-lined section of Goff Brook. The impoundment is used for recreation.

Hazard Classification:	A	Dam Height (ft):	8.3+/-
Dam Length (ft):	170	Spillway Length (ft):	Approx. 60
Spillway Type:	broad-crested weir with two notched bays and stop logs	Normal Freeboard (ft):	0.3
Drainage Area (square miles):	4.53	Impoundment Area (at principal spillway crest, in acres):	3.6
Watercourse(s): Spillway discharges to Goff Brook which flows north to Mill Woods Pond.			

OTHER INFORMATION:

The information presented in the table above was obtained from a CTDEEP Dam Registration Form, a Town of Wethersfield Plan, dated July 1981 showing the Griswold Pond Dam Spillway and proposed repairs to the dam, and from direct observation by GZA. Elevations included in this inspection report are from the Town of Wethersfield Plan, dated July 1981 which has an unknown datum.

Based on plans entitled, "Griswold Pond Spillway, Mill Woods Park, Wethersfield, Connecticut", prepared by the Town of Wethersfield Engineering Division, dated July 8, 1981, File No. 38/1, Map No. M-2488 (Griswold Pond Spillway Plan, dated July 1981) and "Inland Wetlands Application, Mill Woods Park, Griswold Pond, Wethersfield, Connecticut", prepared by the Town of Wethersfield Engineering Division, dated August 31, 1981, File No. 38/14, Map No. M-2488, the pond was apparently lowered and dredged and the spillway was replaced with the current configuration in the early 1980's (refer to Appendix E – Historic Drawings). The Griswold Pond Spillway Plan is the apparent source of the spillway section designations (i.e. the left portion of the spillway as Section A and the right portion as Section B). The Griswold Pond Spillway Plan indicates the top of spillway for Section A and Section B are at El. 80 feet and the notched bays within Section A are at El. 73.67 feet. The 100-year flood elevation is listed at El. 84 feet.

Based on a State of Connecticut Interdepartmental Message from W. Marsh (Field Inspector) to V. Gaigowski (Supt. Of Dam Maintenance), dated October 14, 1982, the dam repairs failed to stop the seepage within the right embankment/abutment area. It was reported in the Interdepartmental Message that porous backfill around an RCP pipe was transmitting water at the right abutment area. The referenced document also indicated that seepage under the embankment located to the right of the spillway was suspected. The proposed repairs

Griswold Pond Dam**Dam ID# 15904****September 27, 2016**

included removal of porous backfill material and replacement with geotextile filter fabric and clay backfill and sealing off the RCP pipe. Mr. Marsh recommended that the dam should continue to have a Class A hazard rating due to the amount of water impounded and downstream conditions. The current location of the RCP pipe is unknown and the RCP pipe is not shown on the Griswold Pond Spillway Plan which depicts the previous spillway replacement.

Based on a letter from the Town of Wethersfield to State of Connecticut Department of Energy and Environmental Protection (CT DEEP), dated August 8, 2013, the Town of Wethersfield hired a contractor to clear several downed trees from Section A of the spillway. The contractor was also engaged to make improvements/ repairs to the embankment contacts with Section A and Section B of the spillway. The pond level was reportedly lowered and steel rebars were drilled into the soil near the spillway contacts and 4,000 psi concrete was placed to control seepage. No other information about the repairs was available. The downed trees appear to have been removed.

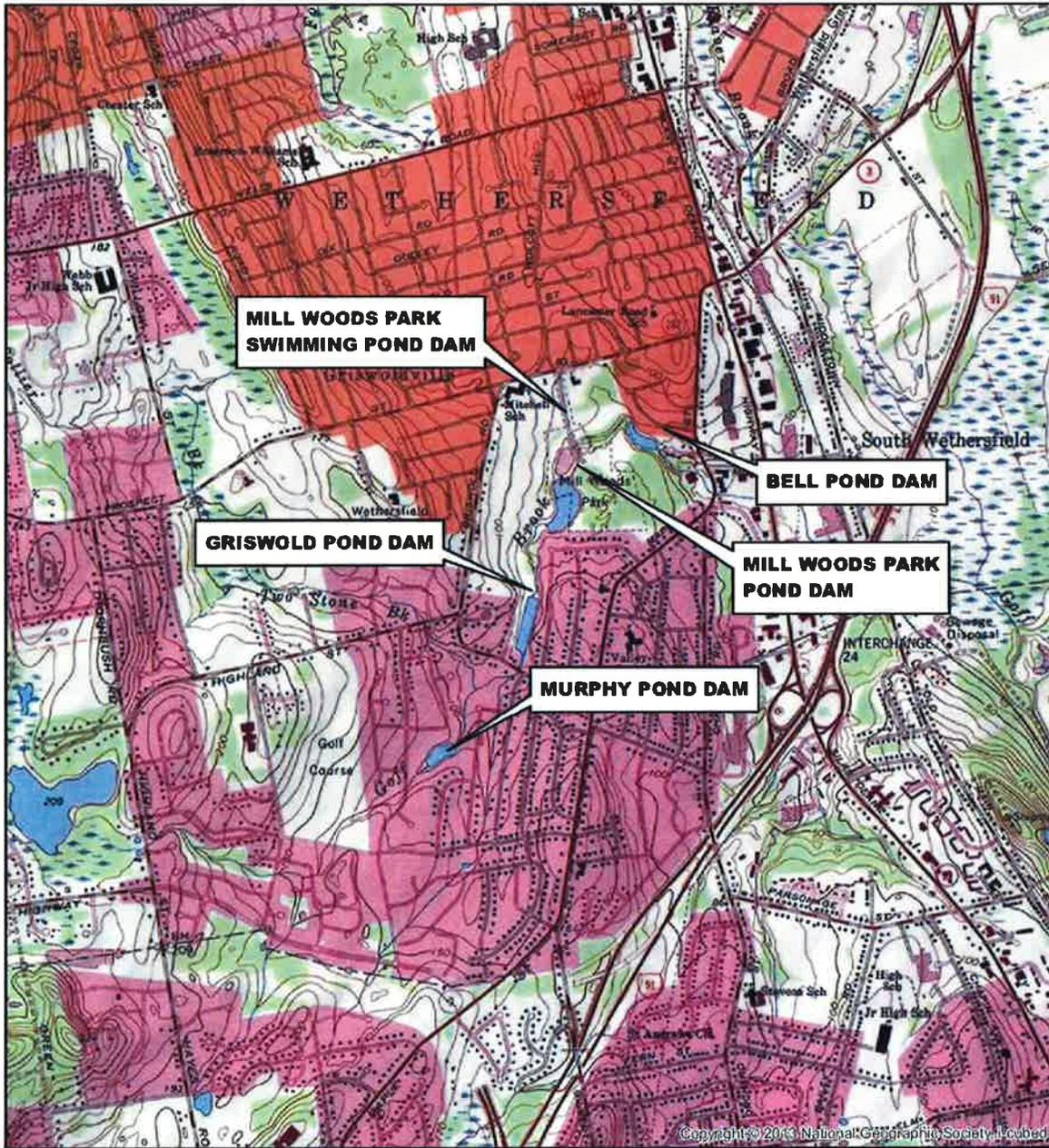
A series of six (6) dams are located on the upper watershed of Goff Brook. The dams, listed in descending order from upstream to downstream, are: 1860 Reservoir Dam (Hazard Class A), Murphy Pond Dam (Hazard Class A), Griswold Pond Dam (Hazard Class A), Mill Woods Park Pond Dam (Hazard Class A), Mill 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.

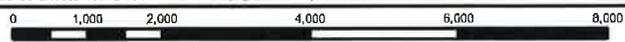
References

"Griswold Pond Spillway, Mill Woods Park, Wethersfield, Connecticut", by Town of Wethersfield Engineering Division, dated July 8, 1981, File No. 38/1, Map No. M-2488

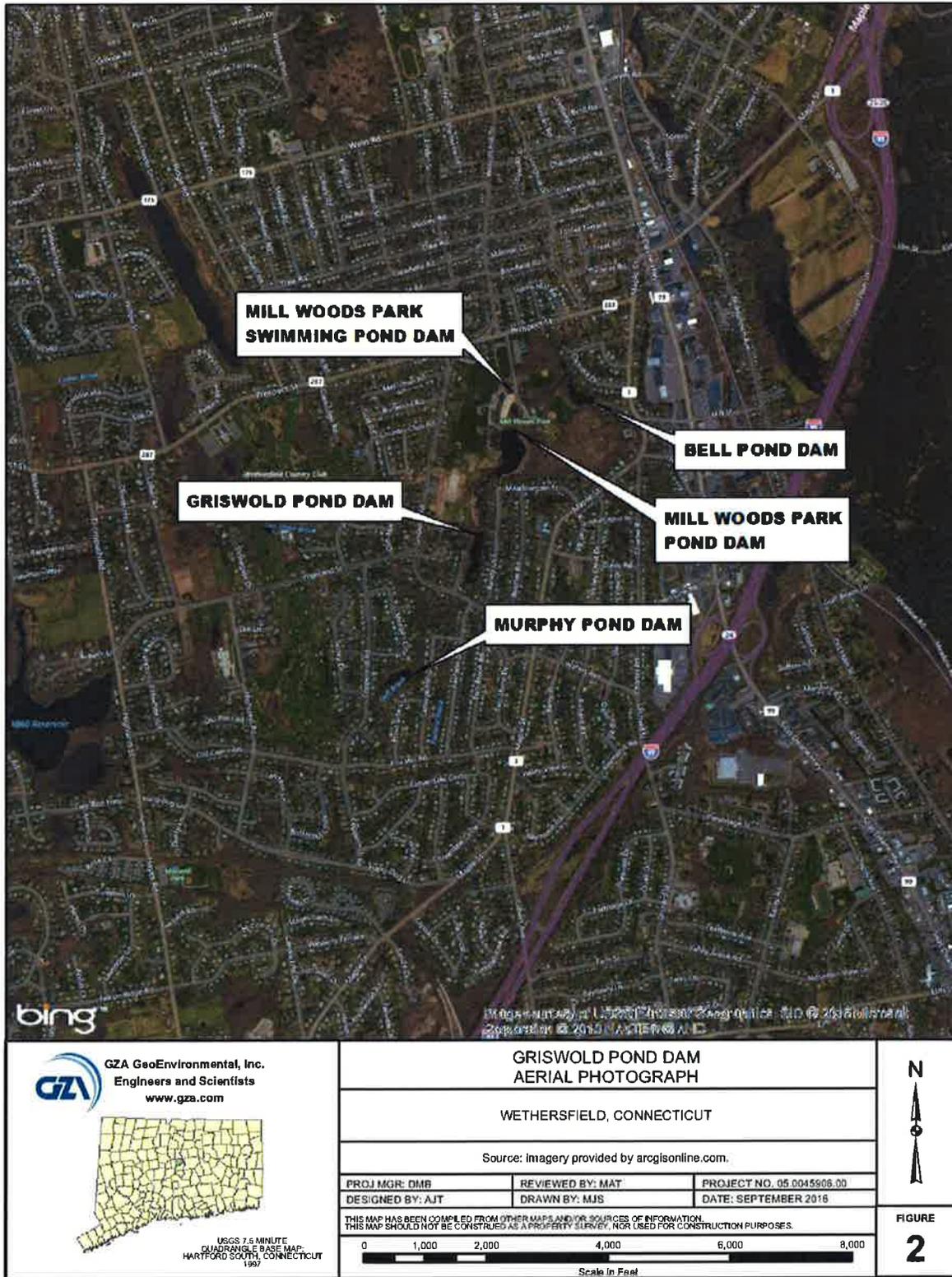
"Inland Wetlands Application, Mill Woods Park, Griswold Pond, Wethersfield, Connecticut", by Town of Wethersfield Engineering Division, dated August 31, 1981, File No. 38/14, Map No. M-2488

Part III: Aerial Photo/Location Map



 <p>GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>  <p>USGS 7.5 MINUTE QUADRANGLE BASE MAP: HARTFORD SOUTH, CONNECTICUT 1897</p>	<p>GRISWOLD POND DAM LOCUS</p>		
	<p>WETHERSFIELD, CONNECTICUT</p>		
	<p>Source: TOPOI maps are USGS topographic maps, Copyright:© 2011 National Geographic Society, i-cubed and are provided by arcgisonline.com.</p>		
	<p>PROJ MGR: DMB DESIGNED BY: AJT</p>	<p>REVIEWED BY: MAT DRAWN BY: MJS</p>	
<p>THIS MAP HAS BEEN COMPILED FROM OTHER MAPS AND/OR SOURCES OF INFORMATION. THIS MAP SHOULD NOT BE CONSIDERED AS A PROPERTY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.</p>			<p>FIGURE 1</p>
 <p>Scale in Feet</p>			

© 2016 - GZA GeoEnvironmental, Inc. J:_45,600-46,999\46906.h08 Town of Wethersfield\45906-00.dwg\GIS\mxd\LOCUS GRIS POND.mxd, 12/6/2016, 1:02:37 PM, max.strubel



Part IV: Dam/Embankment/Dike Information

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

Dam/Embankment/Dike Name (see instructions): Griswold Pond Dam

General Description: The earthen embankment has a maximum height of about 8.3+/- feet and an embankment length of approximately 110 feet. The embankment is about 10-feet long to the right of the spillway and about 100 feet long to the left of the spillway. Existing topography serves as the abutments for the embankment. The embankment crest is estimated to be about 20 to 30 feet wide and is covered with thick brush and vegetation. The upstream and downstream embankment slopes are covered with thick brush and mature trees. The slopes are estimated to be range from 2H:1V to 4H:1V. A wetland area is located at the downstream toe of embankment to the left of the spillway.

General Condition: Poor

Concrete Condition: N/A

Stone Masonry: N/A

Settlement/Alignment/Movement: None observed – observations were obstructed by the thick brush and vegetation.

Seepage/Foundation Drainage: Observations were obscured by the thick brush and vegetation. The embankment at the contact with the left side of Section A and the embankment at the contact with the right side of Section B were previously repaired with grouted riprap and grout-filled fabric bags. Seepage was observed on the downstream face at both of the repaired locations. The seepage was visually estimated to be about 10 gallons per minute to the left of the Section A and less one gallon per minute to the right of the Section B.

Riprap: Grouted riprap and grout-filled fabric bags were observed to the left and right of the spillway where the embankment was repaired at the spillway contact.

Erosion/Burrows: Minor erosion of the embankment was observed to the right of the Section B. The erosion appears to be about 2 inches or less and allows water to flow around the spillway before reaching the Section B elevation.

Vegetative Cover: The upstream and downstream slopes were covered with thick brush and several mature trees (up to 24-inch diameter). The crest of the embankment is covered with thick vegetation and brush.

Other: The downstream slope is uneven apparently due to historical unauthorized dumping of soils and brush on the downstream embankment slope.

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

Part V: Principal Spillway, Training Walls, Apron

Number of Principal Spillways: (2) Two

Spillway Type (see instructions): Section A - Broad crested weir with two notched bays and stop logs

General Description: Section A is 25-foot long, reinforced concrete, broad crested weir with two notched bays and stop logs and is located on the left side of the downstream channel. Based on the Griswold Pond Spillway Plan, dated July 1981, Section A is symmetrical and the 5.5-foot-wide by 6.3-foot deep bays are separated by a 4-foot-wide section of the spillway (refer to Appendix E – Historic Drawings). The concrete at the top of each bay is 24-inches thick. The top of Section A is at El. 80 feet and the notched bays are at El. 73.67 feet. The stop logs were installed to the top of Section A in the left bay and approximately 4 inches below the top of Section A in the right bay at the time of the inspection.

General Condition: Poor – due to the condition of the stop logs (refer to Other section below)

Concrete Condition: Good

Stone Masonry: N/A

Settlement/Alignment/Movement: None observed

Cracks: None Observed

Scouring/Undermining: None Observed - downstream channel submerged

Seepage/Foundation Drainage: None observed - downstream channel submerged

Other: The stop logs do not appear to have been replaced recently and are in poor condition. Water was observed flowing (estimated to be greater than 10 gallons per minute) from the spaces between the stop logs.

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

Spillway Type (see instructions): Section B - Broad crested weir

General Description: Section B is a 24-foot long, reinforced concrete, broad crested weir and is located nearest to the right abutment. Based on Griswold Pond Spillway Plan, dated July 1981, Section B is about 4-feet high and the concrete at the top of the section is 12 inches thick. The top of Section B was designed to be at El. 80 feet, which is the same as Section A. However, the top of Section B was observed to be about 4 inches above the top of Section A.

General Condition: Poor – due to the misalignment of Section B with Section A (see below)

Concrete Condition: Good

Stone Masonry: N/A

Settlement/Alignment/Movement: Section B has moved and rotated such that the downstream face is beyond vertical.

Cracks: None observed.

Scouring/Undermining: The soil has eroded on the downstream side of the Section B and the footing is exposed below the downstream water level. Section B has overturned and moved laterally (downstream) 3 to 4 inches at the top of spillway.

Vegetative Cover: N/A

Riprap: None observed

Seepage/Foundation Drainage: Section B movement has opened a gap between Section A and Section B. The gap is approximately 1.5-inches wide at the top and a wooden board has been installed in the gap to reduce seepage. Seepage was observed in the gap and visually estimated to be about 5 gallons per minute.

Other: Based on a Griswold Pond Spillway Plan, dated July 1981, Section B was designed to be backfilled to within one foot of the top of Section B on the upstream and downstream sides (refer to Appendix E – Historic Drawings). The downstream slope was designed with grouted riprap at the surface for scour protection. The backfill on the upstream side was designed with a clay seal and geotextile filter fabric placed against the Section B concrete and extending downward to the bottom of Section A.

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

Part VI: Auxiliary Spillway, Training Walls, Apron

Number of Auxiliary Spillways: (0) None

Part VII: Downstream Channel

Number of Downstream Channels: (1) One

Channel Name (see instructions), include Watercourse Name: Goff Brook

General Description: The downstream channel is a riprap lined channel which transitions to the natural channel of Goff Brook. The channel flows to the north towards Mill Woods Park Pond Dam.

General Condition: Good

Scouring: None observed

Debris: Small amounts of debris (brush and tree limbs) were observed in the downstream channel.

Riprap: Rip-rap ranging in size from 12- to 24-inch diameter was observed in the downstream channel.

Other: The downed trees blocking Section A of the spillway, which were mentioned in a letter from the Town of Wethersfield to State of Connecticut Department of Energy and Environmental Protection, dated August 8, 2013, appear to have been removed.

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

Part VIII: Intake Structure(s)

Number of Intake Structures: (0) None

Part IX: Outlet Structure(s)

Number of Outlet Structures: (0) None

Part X: Miscellaneous Features

List miscellaneous features: Griswold Pond Dam is accessed from a walking path at the northern terminus of Cheston Circle. It is approximately 400 feet travelling north down the walking path or 1,100 feet north of Griswold Road.

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.](#))*

Griswold Pond Dam is currently classified by the Connecticut Department of Energy and Environmental Protection (CTDEEP) as **Class A (Low) Hazard Potential**. However, Mill Wood Park Pond Dam (**Hazard Class A**) is located approximately 1,800 feet downstream of Griswold Pond Dam and Bell Pond Dam, which is a **Class BB (Moderate) Hazard Potential** dam, is located about 3,600 feet downstream from Griswold Pond Dam. 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 Griswold Pond Dam could potentially result in the "domino" failure of Mill Woods Park Pond Dam and possibly Bell Pond Dam. As such, it appears that Griswold Pond Dam 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.

1. Perform a feasibility study to determine whether the dam should be repaired or removed. If repair of the dam is selected, then the items below should be performed.
2. Perform a hydrologic and hydraulic (H&H) analysis to determine the appropriate spillway design flood, evaluate spillway capacity, and evaluate overtopping potential.
3. Perform a dam breach analysis to determine if the failure of Griswold Pond Dam would result in the overtopping and failure of the downstream Mill Woods Park Pond Dam and Bell Pond Dam. Adjust the hazard class of Griswold Pond Dam accordingly.
4. Evaluate options to repair the embankment at the left and right abutments with the spillway (Section A and Section B). Monitor the previous embankment repairs in these areas on a monthly basis until the new embankment repairs are complete.
5. Evaluate options for repairs or removal and replacement of the spillway at Section B. Monitor Section B on monthly basis until the Section B repair or replacement is complete.

Recurrent Maintenance Recommendations:

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

1. Cut the vegetation/brush on the embankment (crest and upstream and downstream slopes) and remove trees smaller than 3-inch diameter. Fill, compact, seed and maintain grass upon completion.
2. Fill, compact and seed the eroded embankment area at the right abutment contact. Maintain grass upon completion.

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 greater than 3-inch diameter, including root balls, on the embankments (crest and upstream and downstream slopes) and within 25 feet of the dam. Fill, compact, seed and maintain grass upon completion.

GZA recommends the following repairs that can be undertaken by the Owner, do not require engineering design or filing a dam safety permit, but may require consultation with the DEEP Inland Fisheries Division and notification to the Commissioner due to draw down limitations.

1. Replace the worn or damaged stop logs in the Section A bays.

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

Refer to Appendix C for Photographic Log

Part XIV: Sketches

Refer to Appendix C and E 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."

Matthew A. Taylor

7/27/17

Signature of Professional Engineer

Date

Matthew A. Taylor

Associate Principal

26480

Printed Name of Professional Engineer

Title

CT P.E. Number

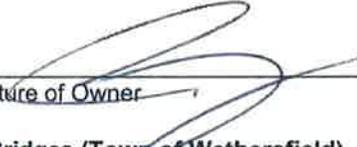
GZA GeoEnvironmental, Inc
Name of Firm

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."	
	7/13/2017
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

APPENDIX A

OVERALL DAM CONDITION SELECTION STANDARDS

Appendix A: Overall Dam Condition Selection Standards

Condition	Definition
Good	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.
Satisfactory	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.
Fair	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.
Poor	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.
Unsatisfactory	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:

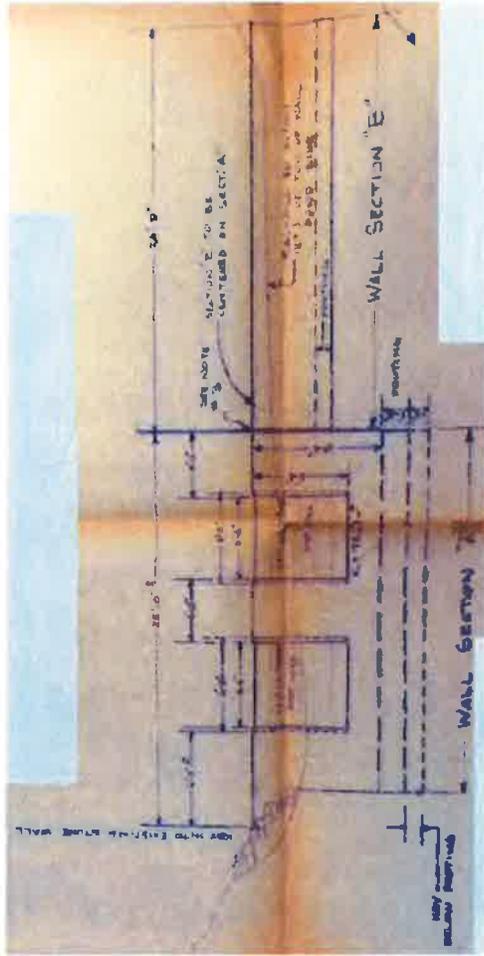
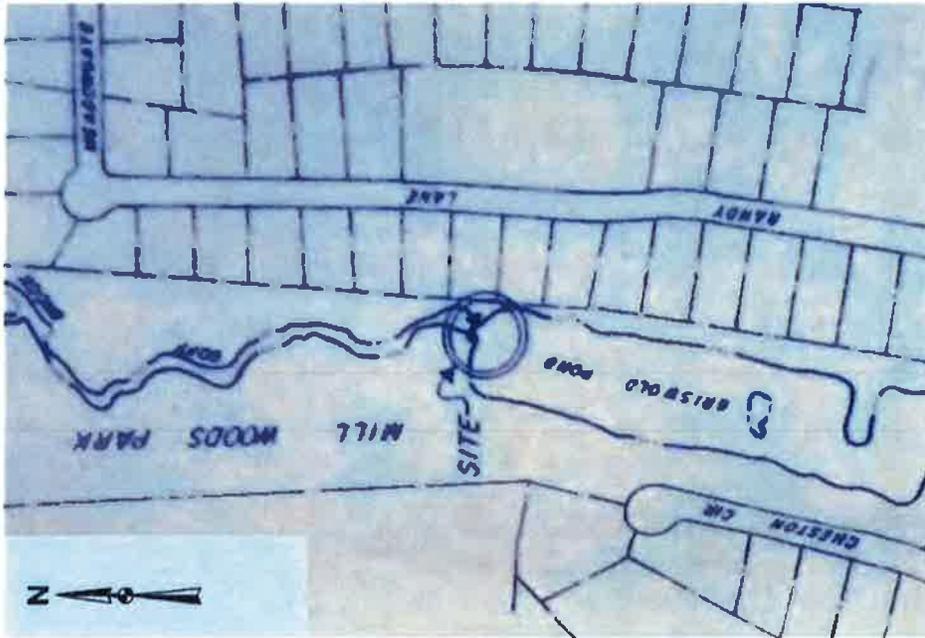
- (i) possible loss of life;
- (ii) minor damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
- (iii) damage to or interruption of the use of service of utilities;
- (iv) damage to primary roadways (less than 1500 ADT) and railroads;
- (v) significant economic loss.

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



GRISWOLD POND DAM SPILLWAY
PLAN AND ELEVATION VIEW
1" = 7'

NOTES:

1. BASEMAP DEVELOPED FROM A PLAN ENTITLED "MILL WOODS PARK, GRISWOLD POND SPILLWAY", BY TOWN OF WETHERSFIELD ENGINEERING DIVISION, FILE NO. 38/14, REVISED JULY 22, 1981. ORIGINAL SCALE AS NOTED.
2. DAM INSPECTION PERFORMED BY GZA PERSONNEL ON SEPTEMBER 27, 2016.

PROJECT NO. _____ SHEET NO. _____ OF _____	
PROJECT NAME: GRISWOLD POND DAM PROJECT LOCATION: GRISWOLD POND OFF RANDY LANE WETHERSFIELD, CONNECTICUT	
SITE SKETCH	
PREPARED FOR: TOWN OF WETHERSFIELD ENGINEERING DIVISION WETHERSFIELD, CONNECTICUT	
PREPARED BY: GZA CONSULTANTS AND SCIENTISTS WWW.GZA.COM	CHECKED BY: JAC DATE: AS NOTED
DESIGNED BY: JAC PROJECT NO.: 05-04-5905.00	SHEET NO.: 3
DATE: MARCH 2017	SHEET NO.: 3



NOTES:

1. AERIAL VIEW AND BASEMAP CREATED USING IMAGERY OBTAINED FROM BING MAPS ON MARCH 21, 2017.
2. DAM INSPECTION PERFORMED BY GZA PERSONNEL ON SEPTEMBER 27, 2018.

PROJECT NO. 18-001 PROJECT NAME GRISWOLD POND DAM PROJECT LOCATION GRISWOLD POND OFF RANDY LANE WETHERSFIELD, CONNECTICUT	
PHOTO LOCATION PLAN	
PREPARED BY GZA SOUTHERN REGIONAL, INC. ENGINEERING DIVISION WETHERSFIELD, CONNECTICUT www.gza.com	
PREPARED BY DAN CHECKED BY DRAWN BY DATE	PROJECT NO. 18-001 PROJECT NAME GRISWOLD POND DAM PROJECT LOCATION GRISWOLD POND OFF RANDY LANE WETHERSFIELD, CONNECTICUT
PROJECT NO. 18-001 PROJECT NAME GRISWOLD POND DAM PROJECT LOCATION GRISWOLD POND OFF RANDY LANE WETHERSFIELD, CONNECTICUT	FIGURE NO. 4 SHEET NO. 4



Client Name:
Town of Wethersfield

Site Location:
Griswold Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 01	Date: 9/27/16
Direction Photo Taken: Westerly	
Photographer: D. Barstow	
Description: Overview of spillway (Section A and Section B) from right abutment.	



Section B

Photo No.: 02	Date: 9/27/16
Direction Photo Taken: Southeasterly	
Photographer: D. Barstow	
Description: Overview of right abutment from the downstream channel. Note: thick brush and vegetation on the embankment crest, upstream and downstream slopes.	



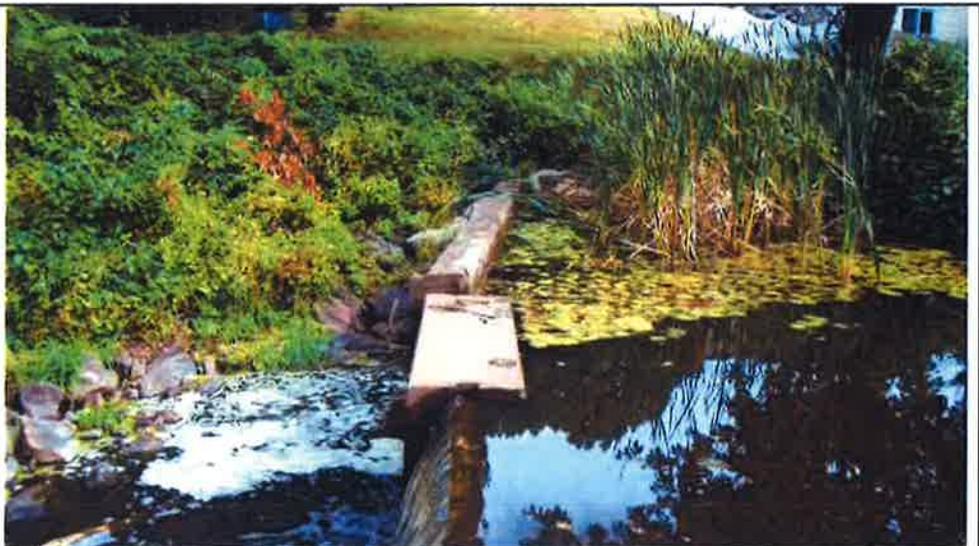


Client Name: Town of Wethersfield	Site Location: Griswold Pond Dam, Wethersfield, CT	Project No.: 05.0045906.00
---------------------------------------------	--------------------------------------------------------------	--------------------------------------

Photo No.: 03	Date: 9/27/16
Direction Photo Taken: Westerly	
Photographer: D. Barstow	
Description: Overview of upstream embankment slope from the right abutment. Note the thick brush and mature trees on the crest and upstream slope.	



Photo No.: 04	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Overview of the right abutment from Spillway Section A. Note the thick brush on the embankment and vegetation growing in the impoundment.	





Client Name:
Town of Wethersfield

Site Location:
Griswold Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 05	Date: 9/27/16
Direction Photo Taken: Westerly	
Photographer: D. Barstow	
Description: Overview of dam crest looking towards the left abutment. Note thick brush and mature trees on the embankment crest and upstream and downstream slopes.	



Photo No.: 06	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Overview of downstream channel from the Section A abutment with the embankment.	





Client Name:
Town of Wethersfield

Site Location:
Griswold Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 07	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Overview of downstream slope looking from the left abutment. Note dense brush and mature trees on the embankment slope.	



Photo No.: 08	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Overview of Section A and Section B from the Section A abutment with the embankment. Note Section B has moved and rotated about 3- to 4-inches downstream. The downstream wall face is beyond vertical.	





Client Name: Town of Wethersfield	Site Location: Griswold Pond Dam, Wethersfield, CT	Project No.: 05.0045906.00
---------------------------------------------	--------------------------------------------------------------	--------------------------------------

Photo No.: 09	Date: 9/27/16
Direction Photo Taken: Westerly	
Photographer: D. Barstow	
Description: Overview of Section A from downstream looking toward the left abutment.	



Photo No.: 10	Date: 9/27/16
Direction Photo Taken: Southeasterly	
Photographer: D. Barstow	
Description: Overview of Section A from downstream looking towards the right abutment. Note stop logs in weir and water seeping through stop logs.	





Client Name:

Town of Wethersfield

Site Location:

Griswold Pond Dam, Wethersfield, CT

Project No.:

05.0045906.00

Photo No.:
11

Date:
9/27/16

Direction Photo Taken:
Westerly

Photographer:
D. Barstow

Description:

Repair at the Section A contact with the embankment. The repair consists of grout-filled fabric bags and grouted rip rap.



Photo No.:
12

Date:
9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:

Repair at the Section A contact with the embankment looking upstream. Seepage through the riprap and grout was observed and estimated to be approx. 10 gallons per minute.





Client Name:
Town of Wethersfield

Site Location:
Griswold Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 13
Date: 9/27/16

Direction Photo Taken:
Northerly

Photographer:
D. Barstow

Description:

Overview of downstream channel (Goff Brook) looking downstream from the spillway. Note rip-rap in channel.



Photo No.: 14
Date: 9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:

Overview of reservoir area (Griswold Pond) looking upstream from the spillway.



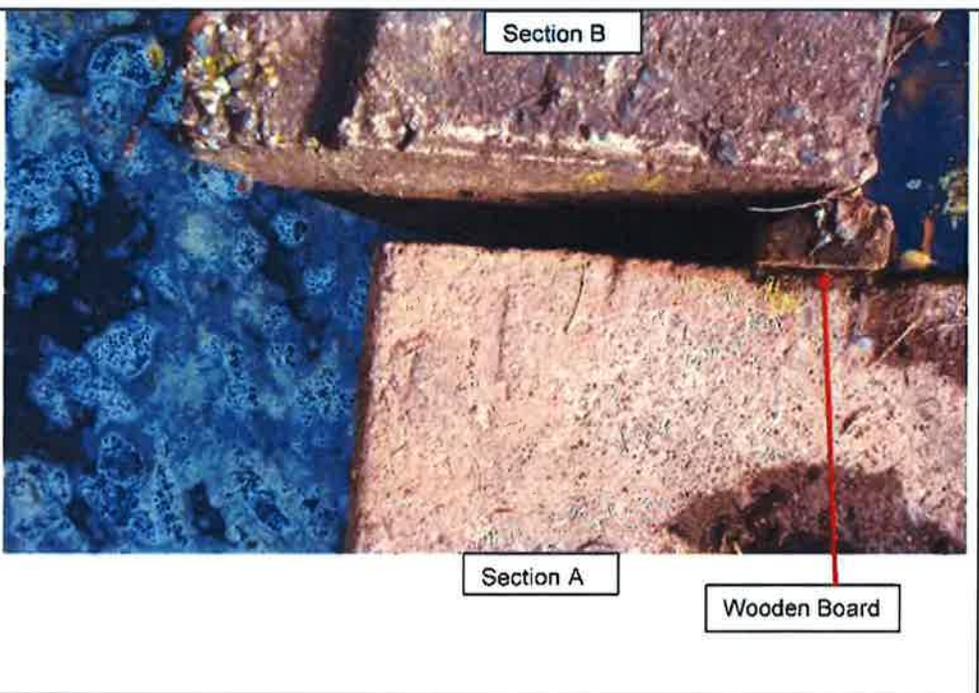


Client Name: Town of Wethersfield	Site Location: Griswold Pond Dam, Wethersfield, CT	Project No.: 05.0045906.00
---------------------------------------------	--------------------------------------------------------------	--------------------------------------

Photo No.: 15	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Repair at the Section B contact with the embankment looking towards the right abutment. The repair appears to consist of grouted riprap and grout filled fabric bags. Minor seepage through the riprap and grout was observed.	



Photo No.: 16	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Gap between Section A and Section B. Note the wooden board placed in the 1.5-inch crack. Water was observed seeping at approx. 5 gallons per minute through the crack.	



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 Griswold 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.

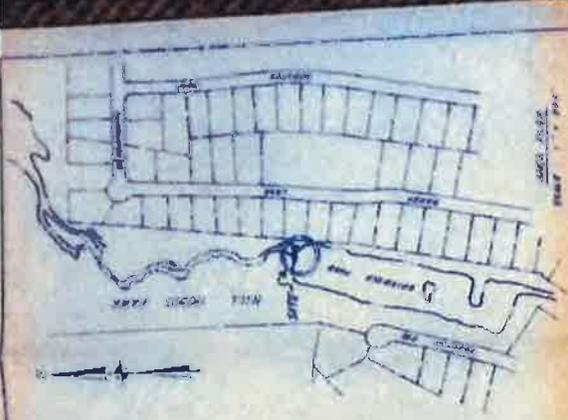
COST ESTIMATES

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

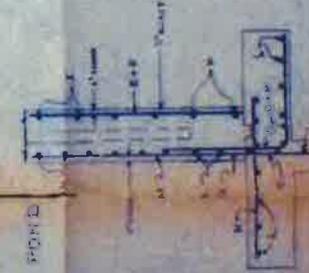
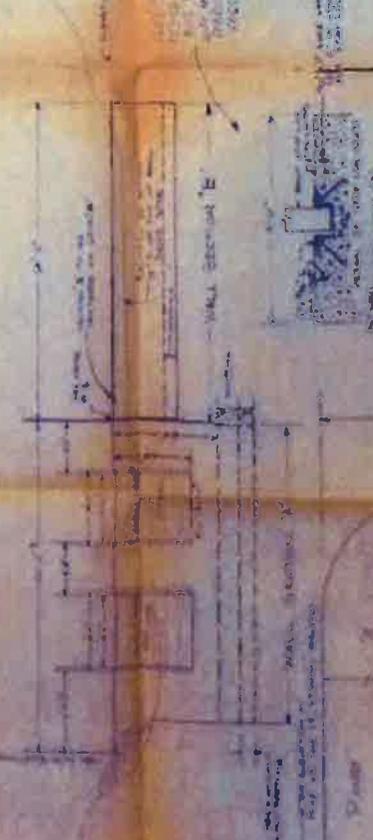
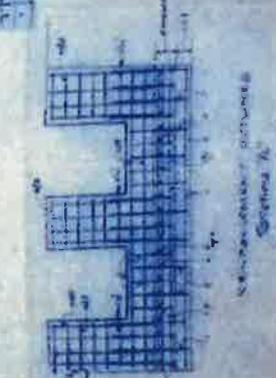
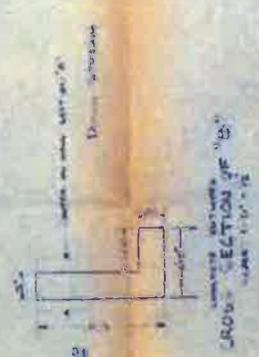
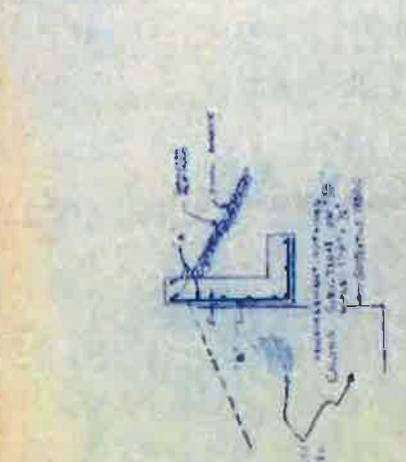
14. It is recommended that GZA be retained to provide services during any future: site observations, explorations, evaluations, design, implementation activities, construction and/or implementation of remedial measures recommended in this Report. This will allow us the opportunity to: i) observe conditions 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.

APPENDIX E
HISTORIC DRAWINGS



MATERIALS		QUANTITIES		COSTS	
NO.	DESCRIPTION	CU YDS.	UNIT PRICE	TOTAL COST	PER CU YD.
1	Excavation	1000	0.15	150.00	0.15
2	Concrete	500	0.30	150.00	0.30
3	Reinforcing Steel	100	1.50	150.00	1.50
4	Foundation	200	0.20	40.00	0.20
5	Other	50	0.10	5.00	0.10
TOTAL		1850		495.00	

TOWN OF WETMORED
 WILL WOODS LAKE
 DAM AND SPILLWAY
 1914



CROSS SECTION OF A
 DAM

SPILLWAY

