REPORT

The City of Mountain Park

Sediment Study
Lake Garret
Mountain Park Road at Lakeshore Drive
Mountain Park, Georgia

Project Number: 2016.5869.01

Survey Dates:
October 20, 25, 26, and 27, 2016
Report Date:
November 17, 2016

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November 17, 2016

City of Mountain Park
118 Lakeshore Drive
Roswell, GA 30075

RE: Sediment Evaluation
Lake Garret
Mountain Park, Georgia
Project No.: 2016.5869.01

Attn. City Clerk:

United Consulting has completed the sediment evaluation on the above referenced lake. Our evaluation focused on documenting the amount of sediment within the lake. Included with this report are the results of this evaluation and comments concerning this project.

UNITED CONSULTING

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Project Environmental Specialist

David P. Huetter
Director of Ecological Services

MGA/DPH/slv

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE 3
PROJECT SITE DESCRIPTION 3
INVESTIGATIVE PROCEDURES 3
RESULTS AND DISCUSSION 4
Sediment Measurements and Analysis 4
CONCLUSIONS.....5
LIMITATIONS.....5

Tables

Table 1 – Sediment Survey Data
Table 2 – Average Survey Data

FIGURES

Figure 1 Site Location Map
Figure 2 USGS Topographic Map
Figure 3A Transect Location Map
Figure 3B Transect Location Map
Figure 4 Sediment Survey Profiles
Figure 5 Sediment Survey Profiles (continued)
Figure 6 Lake Sediment Depth/Thickness Map
Figure 7 Lake Sediment Topography-Top of Sediment
Figure 8 Lake Hard Bottom Topography

ATTACHMENTS

Site Photographs

INTRODUCTION AND PURPOSE

United Consulting was authorized to conduct a sediment evaluation on Lake Garret. The lake is located in the City of Mountain Park in Fulton County, Georgia. The general location of the lake is illustrated on Figure 1.

The City of Mountain Park is anticipating dredging sediment at a future date to increase the water depth and volume within the lake. This assessment was conducted in order to collect data concerning water depths and approximate sediment depths to aid in this future dredging.

PROJECT SITE DESCRIPTION

Lake Garret is an approximately 17 acre man-made impoundment of Rocky Creek. The watershed for the lake is developed with mostly residential homes and a golf course. Multiple other lakes are located within the upstream watershed. A large wetland system is located immediately upstream of the lake. The western portion of the lake, near the dam, was also fed by an unnamed stream which emerged from another pond approximately 3,100 feet to the southwest. Lake Garret measures approximately 1,900 feet from the dam on the western end to the wetland system on the eastern end and ranges from about 250 feet to 500 feet wide. During the survey work, United Consulting observed the upper (eastern) half of the lake to be very shallow with dense aquatic vegetation growth. United Consulting's measurements indicate an average water depth of approximately 2.5 feet across the lake. A copy of the USGS topographic map of the area is included as Figure 2.

INVESTIGATIVE PROCEDURES

The lake evaluation focused on the existing recognizable conditions of the lake and on the amount of benthic sediment within the lake. The term benthic refers to sediments that have entered the lake and settled along the lake bottom. To measure the existing sediment, transects were established generally from shoreline to shoreline, and generally perpendicular to the flow entering the lake. Prior to mobilization to the field, a total of 15 transects were proposed across the lake. Upon arrival it was determined that an additional 16th transect should be located across the inflow at the southwestern corner of the lake. Based on the shallow conditions and sediment depth, it was not practical to measure transects T-1, T-2, T-4, and T-5. These transects were located on the eastern end of the lake, near the wetland area (vegetated shallows), where the water depth was too shallow to collect measurements from a boat. United Consulting instead took measurements at representative points in these areas and recorded the locations using a Trimble GeoXH global positioning system capable of sub-foot accuracy. Measurements in these areas were collected where safely accessible in waders. Transect endpoints were also recording using the same GPS equipment. Transect T-3 was located at the mouth of the southern cove at the eastern end of the Lake. Transect T-6 was located at the northern cove at the eastern end of

the lake. Transects, T-7 through T-15 were located across the main body of the lake. Transect T-16 was located across the mouth of the inflow on the southwestern side of the lake. The GPS data was utilized to generate a map of the lake, transect, and measurement locations. The Transect Location Map is included as Figure 3 of this report.

A measurement of water depth was taken at points along the transect lines with a 1.25-inch diameter, graduated rod followed by a depth measurement to "hard" bottom. The "hard" bottom elevation was used as a benchmark to represent the actual lake bottom prior to impoundment and sediment accumulation. However, the measurable "hard" bottom can vary due to consolidation of sediment over time and the consistency of the underlying soils. The water depths and soft, unconsolidated sediment depths were measured at regular intervals of 10 feet to 30 feet along each transect.

RESULTS AND DISCUSSION

The field investigation included measurements of the lake features, sediment depth probing along the established transects, and a visual evaluation of the current conditions of the lake. Details concerning the results of the field investigation are provided below.

Sediment Measurements and Analysis

Our field investigation included evaluation of sediment loads in the lake. United Consulting sampled along 12 transects and at points within the two shallow cove areas. Transects were placed approximately perpendicular to the estimated inflows of the lake. The transect endpoints were based on field observations and were marked in the field with a wooden stake. A total of 192 measurements were taken. The data collected was used to evaluate the water depths and depths of existing sediment within the lake and to provide profiles of the current lake bottom.

An average water depth of approximately 2.5 feet was measured throughout the transects. Total unconsolidated sediment thickness in the surveyed areas ranged from 0 feet to 7.5 feet, with an average of almost four feet of sediment. Variation was noted in the sediment depths measured across the transects, which is expected. This is typically due to variations of the original hard bottom of the lake, variations in the grain size and density of the sediment, dispersion of sediment across the lake, and consolidation of the sediment, which occurs over time and causes resistance to the sediment probe. Therefore, the measurements presented should not be considered exact. Figures 4 and 5 provide a graphical representation of the sediment thicknesses measured along the transects. Table 1 and Table 2 provide a summary of the data collected across the transects. Figure 6 provides the recorded data values (water depth and sediment depth) by location. Figure 7 illustrates the top of sediment contours and Figure 8 illustrates the lake bottom contours.

CONCLUSIONS

Based on our field observations and data collection, the lake has an average of almost four feet of sediment deposition. As would be expected, the eastern portion of the lake had the most sediment deposition. This is especially true of the southern most of the two eastern coves. Water levels within the lake averaged less at 2.46 feet. The shallowest water depths were along the eastern portions of the lake and at the mouth of the water inflow at the southwestern end of the lake. None of the transects measured had less than an average of three feet of soft sediment. Average water depths across the transects did not exceed 4.5 feet.

Based on the measurements, there are significant amounts of accumulated sediment within the lake. The southeastern inlet of the lake had a water depth that averaged less than a foot deep with an average sediment depth of over 4.5 feet. Excavation of sediment from the lake is recommended in order to improve the conditions and viability of the lake.

LIMITATIONS

Conclusions within this report are based on basic data calculations, extrapolation between data points and sampling. An attempt to determine a rate of sediment accumulation or to date the existing benthic sediments would require extensive engineering and scientific analyses, which is beyond the scope of this evaluation. No warranty or guarantee is expressed or implied. Our firm is not responsible for the conclusions, opinions or recommendations of others.

We appreciate the opportunity to be of service on this project, and we look forward to working with you again. Should you have any questions or comments, please feel free to contact our office.

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Table 1. Sediment Survey Data for Garret Lake

Distance from Shore	Recorded Water Depth	Recorded Hard Bottom	Calculated Soft Sediment
Transect T-3			
0	0.2	4.8	4.6
10	0.4	5.5	5.1
20	0.9	5.5	4.6
30	1.5	4.9	3.4
40	1.5	5.7	4.2
50	1.0	6.6	5.6
60	0.8	5.5	4.7
70	0.8	6.1	5.3
80	0.5	4.8	4.3
90	0.4	4	3.6
100	0.5	4.7	4.2
110	0.4	3.6	3.2
120	0.5	4.2	3.7
130	0.9	3.5	2.6
140	0.5	3.2	2.7
149	0.3	1.6	1.3
Transect T-6			
2	0.2	0.9	0.7
10	1.0	3.9	2.9
20	1.9	4.8	2.9
30	1.9	4.9	3.0
40	1.6	6.5	4.9
50	1.5	5.0	3.5
60	1.9	7.0	5.1
70	2.0	4.5	2.5
80	1.9	7.2	5.3
90	1.7	7.5	5.8
100	1.8	7.9	6.1
110	1.6	7.5	5.9
120	1.3	7.2	5.9
130	1.2	7	5.8
140	1.4	6.9	5.5
150	1.2	5.2	4.0
160	1.2	5.5	4.3
170	0.9	5.6	4.7
180	0.9	5.8	4.9
190	0.5	2.4	1.9
Transect T-7			
4.5	1.0	2.4	1.4
30	0.8	6.3	5.5
60	1.6	8.0	6.4
90	1.8	6.0	4.2
120	1.6	7.3	5.7
150	1.5	2.9	1.4
180	1.5	3.1	1.6

Distance from Shore	Recorded Water Depth	Recorded Hard Bottom	Calculated Soft Sediment
Transect T-7 Continued			
210	1.4	3.8	2.4
240	1.6	4.3	2.7
270	2.1	7.3	5.2
300	2.1	7.9	5.8
330	2.5	8.5	6.0
360	2.4	6.2	3.8
390	2.9	7.4	4.5
420	2.5	3.5	1.0
Transect T-8			
30	2.3	7.6	5.3
60	1.8	5.9	4.1
90	1.8	3.3	1.5
120	1.8	6.4	4.6
150	2.5	10.0	7.5
180	2.7	7.9	5.2
210	2.5	9.8	7.3
240	2.1	6.5	4.4
270	2.5	6.4	3.9
300	2.9	6.5	3.6
330	3.0	5.5	2.5
360	2.4	2.4	0
Transect T-9			
2	0.1	1.3	1.2
30	1.9	5.3	3.4
60	2.4	7.0	4.6
90	2.2	6.9	4.7
120	2.3	6.4	4.1
150	3.1	6.8	3.7
180	3.4	8.7	5.3
210	2.2	8.9	6.7
240	2.9	8.8	5.9
270	3.5	10.0	6.5
300	0.1	2.9	2.8
Transect T-10			
1	0.1	0.7	0.6
30	2.6	4.7	2.1
60	2.9	6.1	3.2
90	3.0	7.2	4.2
120	3.0	7.2	4.2
150	3.1	7.4	4.3
180	3.2	7.7	4.5
210	3.2	7.2	4.0
240	3.3	8.4	5.1
270	3.8	8.4	4.6
300	3.9	8.7	4.8

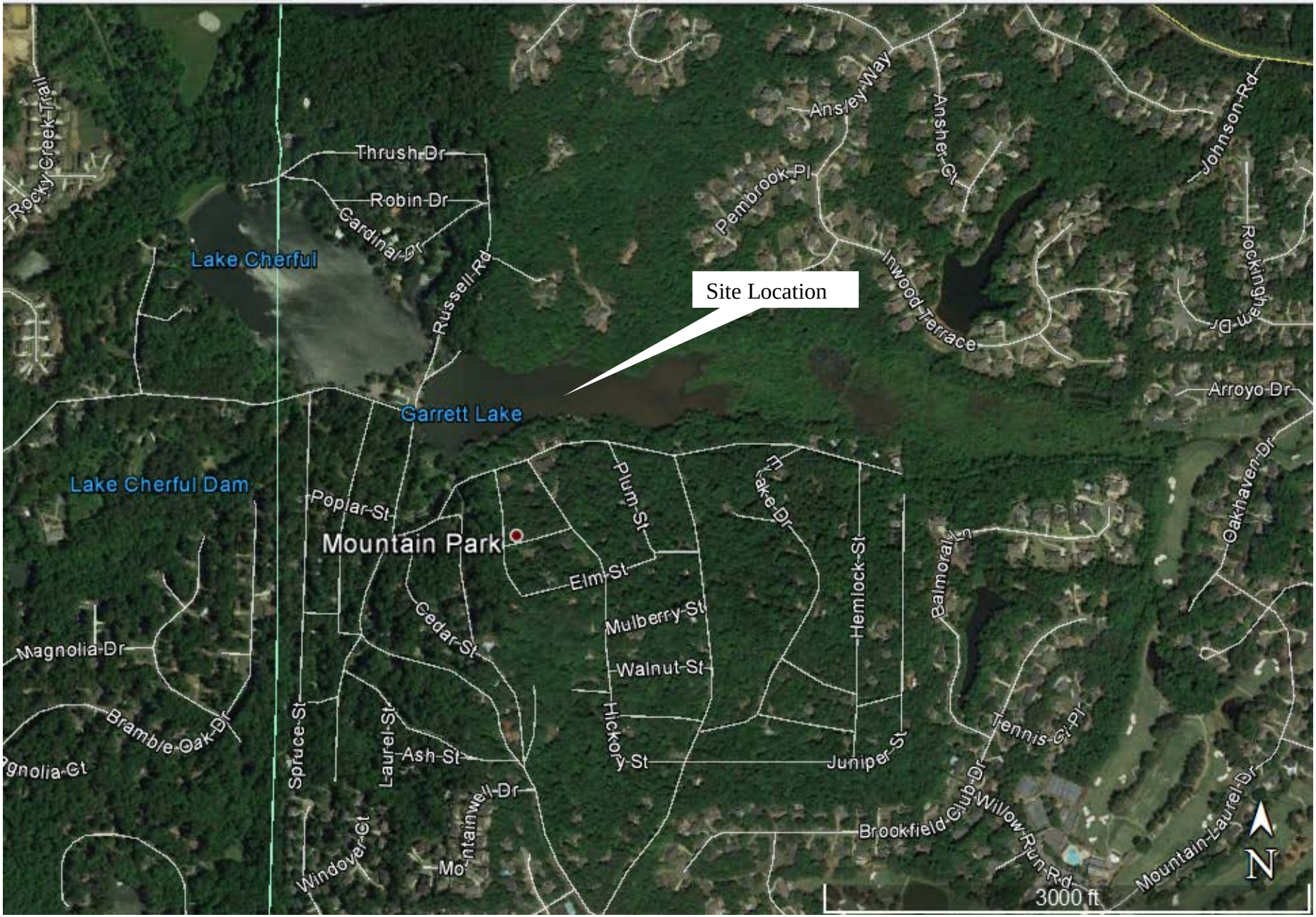
Distance from Shore	Recorded Water Depth	Recorded Hard Bottom	Calculated Soft Sediment
Transect T-11			
30	3.3	7.8	4.5
60	3.8	8.6	4.8
90	4.0	8.3	4.3
120	4.0	8.0	4.0
150	4.4	8.4	4.0
180	4.6	7.8	3.2
210	4.2	8.7	4.5
240	3.9	8.2	4.3
270	3.6	7.5	3.9
300	3.5	8.8	5.3
330	5.5	9.6	4.1
360	2.0	5.1	3.1
368	0.1	0.7	0.6
Transect T-12			
0	0.4	1.4	1.0
30	4.1	7.2	3.1
60	4.5	8.9	4.4
90	4.9	8.9	4.0
120	5.1	8.2	3.1
150	5.0	10.1	5.1
180	6.1	11.4	5.3
210	4.6	10.1	5.5
240	4.2	7.7	3.5
270	4.0	8.0	4.0
300	3.6	9.3	5.7
330	1.0	3.4	2.4
Transect T-13			
0	0.1	0.1	0
30	4.0	6.8	2.8
60	4.8	8.8	4.0
90	5.0	8.4	3.4
120	5.2	8.8	3.6
150	5.7	9.3	3.6
180	7.5	11.2	3.7
210	5.1	8.3	3.2
240	4.8	8.6	3.8
270	4.7	8.4	3.7
300	4.8	8.9	4.1
330	4.7	8.3	3.6
360	4.6	8.1	3.5
390	4.0	6.6	2.6
420	2.5	4.1	1.6
Transect T-14			
3	0.2	1.0	0.8
30	4.2	6.3	2.1

Distance from Shore	Recorded Water Depth	Recorded Hard Bottom	Calculated Soft Sediment
Transect T-14 Continued			
60	5.0	8.4	3.4
90	5.0	8.2	3.2
120	5.2	8.5	3.3
150	6.0	9.5	3.5
180	6.4	10.4	4.0
210	5.5	6.9	1.4
240	5.0	7.9	2.9
270	5.0	8.1	3.1
300	4.9	8.6	3.7
330	4.6	8.4	3.8
360	4.5	9.0	4.5
390	4.4	8.6	4.2
420	4.4	8.6	4.2
450	4.3	7.5	3.2
480	4.1	7.3	3.2
510	3.5	7.9	4.4
540	3.1	5.1	2.0
570	2.5	4.0	1.5
585	1.0	2.5	1.5
Transect T-15			
3	0.1	0.9	0.8
30	4.6	8.3	3.7
60	6.2	8.7	2.5
90	7.3	11.3	4.0
120	6.5	11.5	5.0
150	6.7	12.7	6.0
180	6.0	10.0	4.0
210	6.0	11.0	5.0
240	5.8	9.2	3.4
270	5.6	11.6	6
300	5.0	9.5	4.5
330	4.5	8.2	3.7
360	4.1	8.5	4.4
390	4.4	8.0	3.6
420	3.7	7.7	4.0
450	2.9	4.4	1.5
480	3.9	7.3	3.4
510	2.8	7.3	4.5
540	2.6	6.6	4.0
570	1.7	5.6	3.9
600	1.1	3.3	2.2
630	0.05	0.8	0.75
Transect T-16			
7	0.3	2.3	2.0
10	2.0	2.8	0.8

Distance from Shore	Recorded Water Depth	Recorded Hard Bottom	Calculated Soft Sediment
Transect T-16 Continued			
20	0.3	3.8	3.5
30	1.0	7.2	6.2
Points not on Transects			
P-1A	0.7	4.3	3.6
P2-A	0.9	4.6	3.7
P-3A	1.0	4.4	3.4
P-4A	1.5	4.0	2.5
P-5A	1.7	4.4	2.7
P-6A	1.4	4.7	3.3
P-7A	1.3	5.0	3.7
P-1	0.4	5.5	5.1
P-2	0.4	5.5	5.1
P-3	0.3	6.0	5.7
P-4	0.3	5.3	5.0
P-5	0.3	5.9	5.6
P-6	0.3	4.9	4.6
P-7	1.0	5.4	4.4
P-8	0.4	5.2	4.8
P-9	0.6	7.3	6.7
P-10	0.7	6.1	5.4
P-11	0.5	6.4	5.9
P-12	0.7	4.9	4.2
P-13	0.5	5.7	5.2
P-14	0.2	4.9	4.7

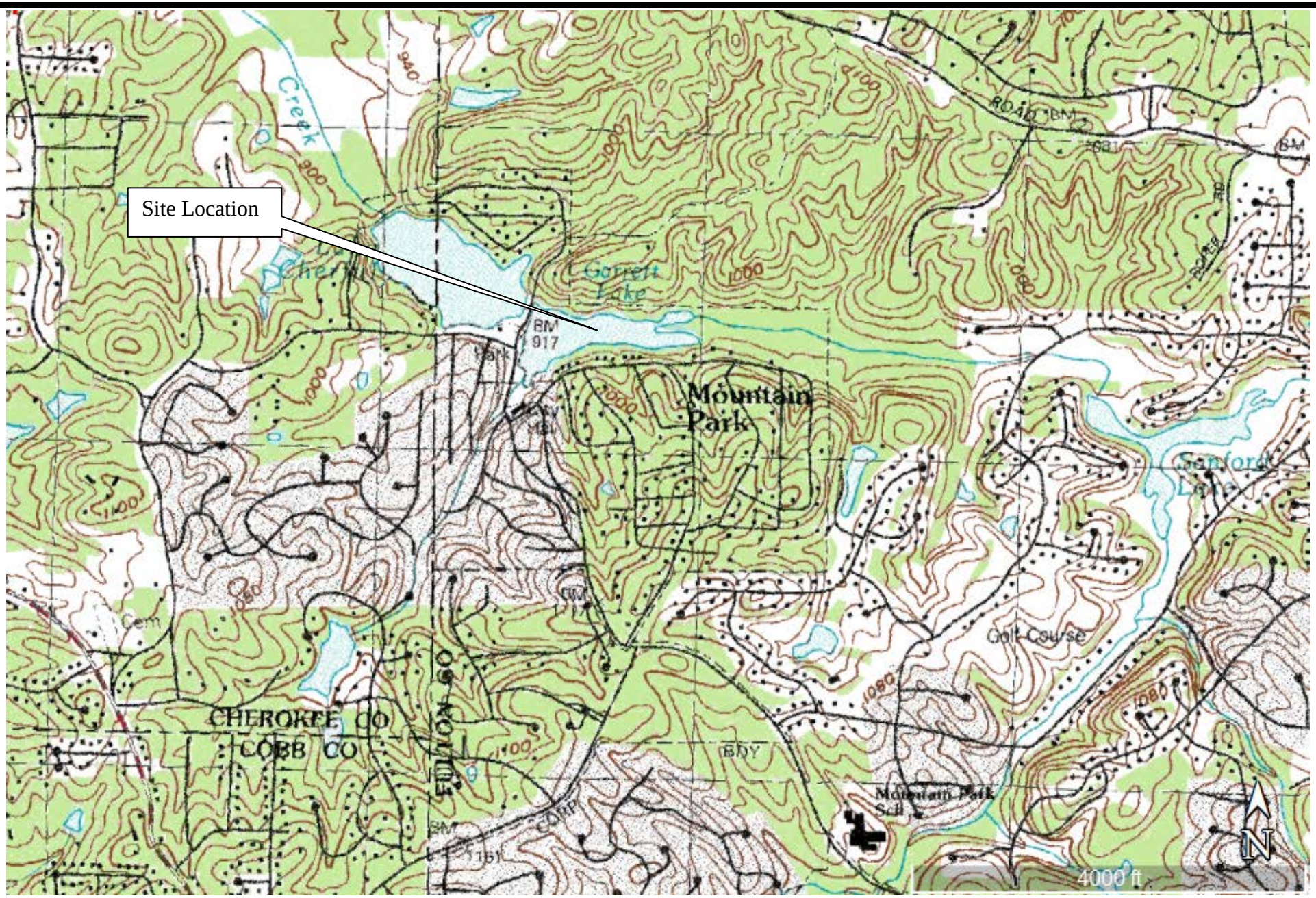
Table 2. Average Sediment Survey Data for Lake Garret

Transect	Sediment Thickness (Feet)			Average Water Depth(Feet)
	Maximum	Minimum	Average	
T-3	5.6	1.3	3.94	0.69
T-6	6.1	0.7	4.28	1.38
T-7	6.4	1.0	3.84	1.82
T-8	7.5	0	4.16	2.36
T-9	6.7	1.2	4.45	2.19
T-10	5.1	0.6	3.78	2.92
T-11	5.3	0.6	3.89	3.61
T-12	5.7	1.0	3.93	3.96
T-13	4.1	0	3.15	4.50
T-14	4.5	0.8	3.04	4.23
T-15	6.0	0.75	3.68	4.16
T-16	6.2	0.8	3.13	0.90
Northern Cove (Points P-1A to P-7A)	3.7	2.5	4.49	1.21
Southern Cove(Points P-1 to P 14)	6.7	4.2	5.64	0.47
Average	5.69	1.10	3.96	2.46



We're here for you UNITED CONSULTING	N	Scale:	As Shown	Notes:	Client:	City of Mountain Park
		Prepared:	MGA		Site:	Lake Garret
		Checked:				
		Project No.:	2016.5869.01		Title:	Site Location

FIG.1



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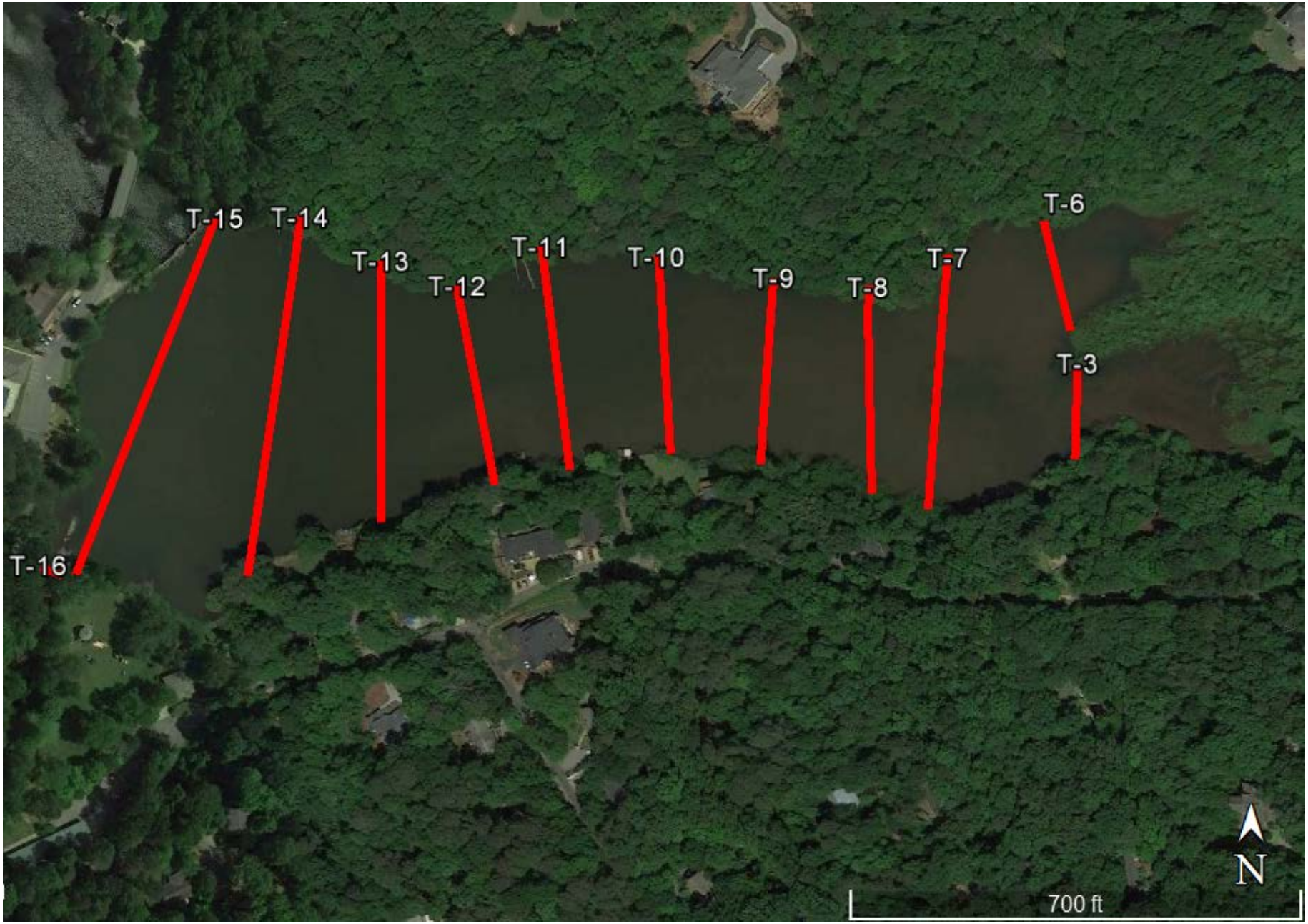
		Prepared:	MGA		Site:	Lake Garret
		Checked:				
		Project No.:	2016.5869.01		Title:	USGS Topographic Map

FIG.2



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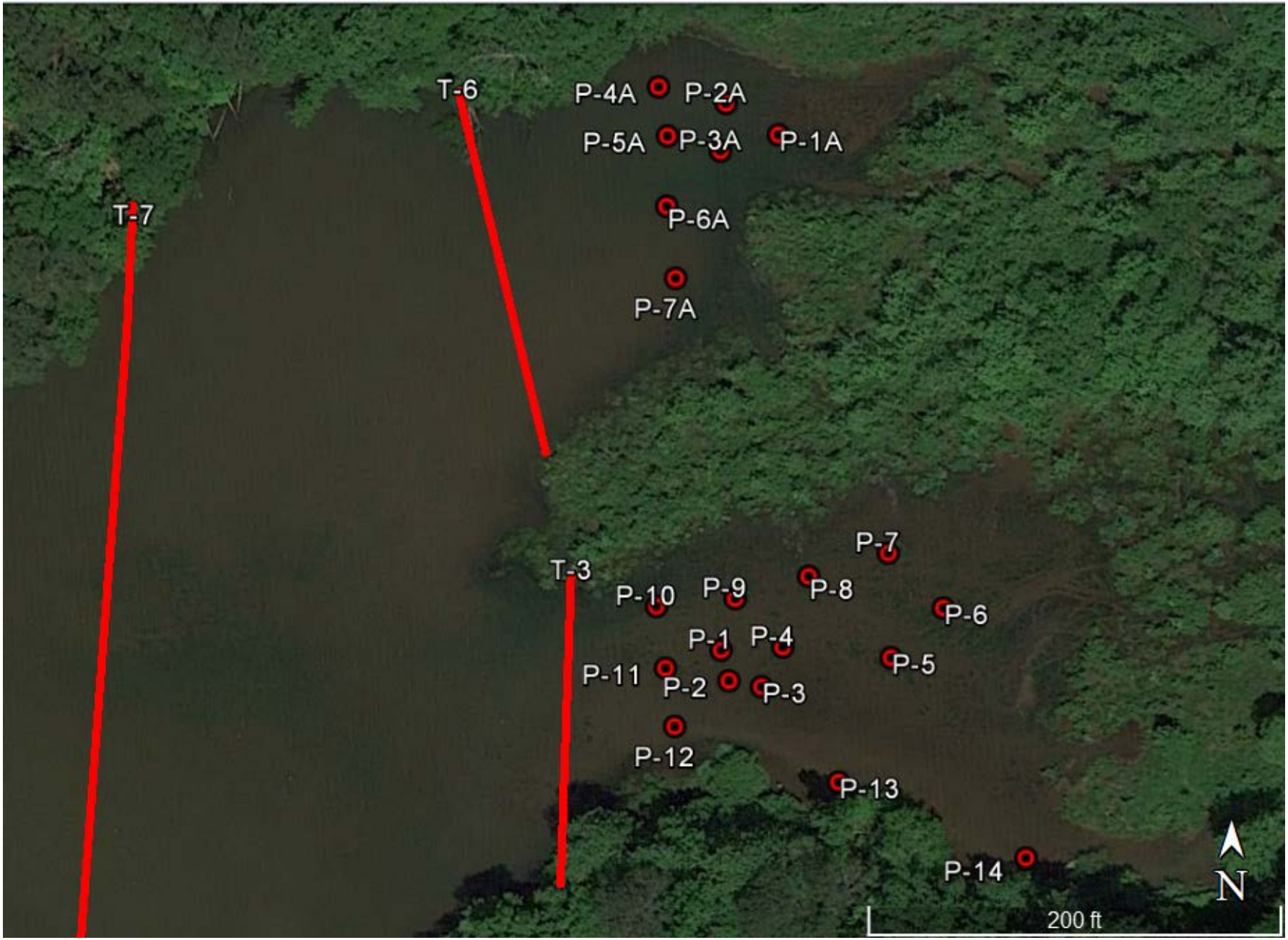
		Prepared:	MGA		Site:	Lake Garret
		Checked:				
		Project No.:	2016.5869.01		Title:	Transect Locations

FIG.3A



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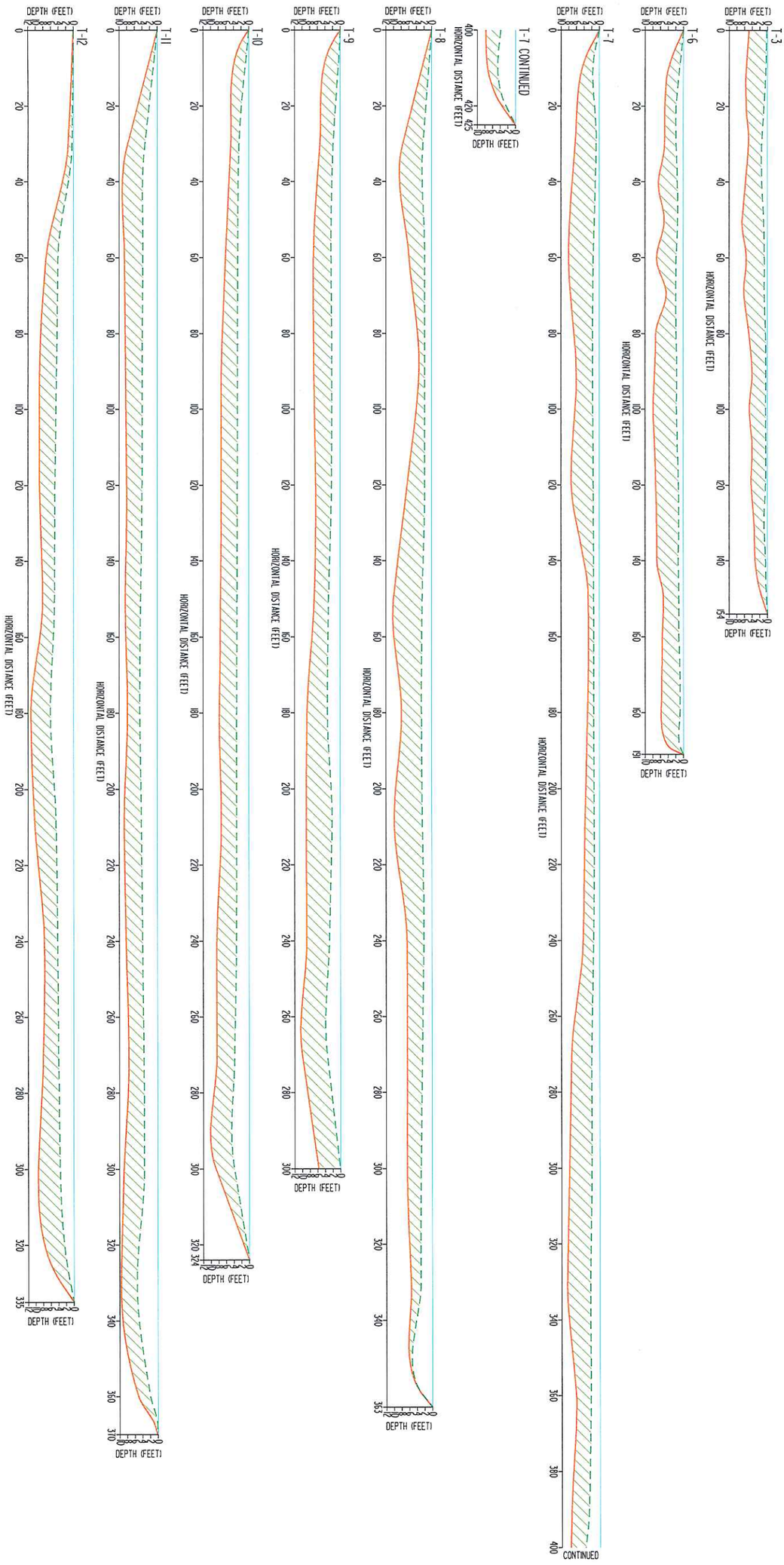
		Prepared:	MGA		Site:	Lake Garret
		Checked:				
		Project No.:	2016.5869.01		Title:	Transect Locations

FIG.3B



LEGEND

- TOP OF SEDIMENT
- HARD BOTTOM
- AREA OF SEDIMENT

SCALE: 1" = 30'	DATE: 11-14-16	PROJECT NO: 2016.5869.01	TITLE: LAKE SEDIMENT CROSS SECTIONS GARRETT LAKE MOUNTAIN PARK, FULTON COUNTY, GEORGIA
DRAWN: VPV	CHECKED: MGA	REVISIONS:	
CLIENT: CITY OF MOUNTAIN PARK			UNITED CONSULTING — We're here for you

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FIG. 4

LEGEND

- TOP OF SEDIMENT
- HARD BOTTOM
- AREA OF SEDIMENT

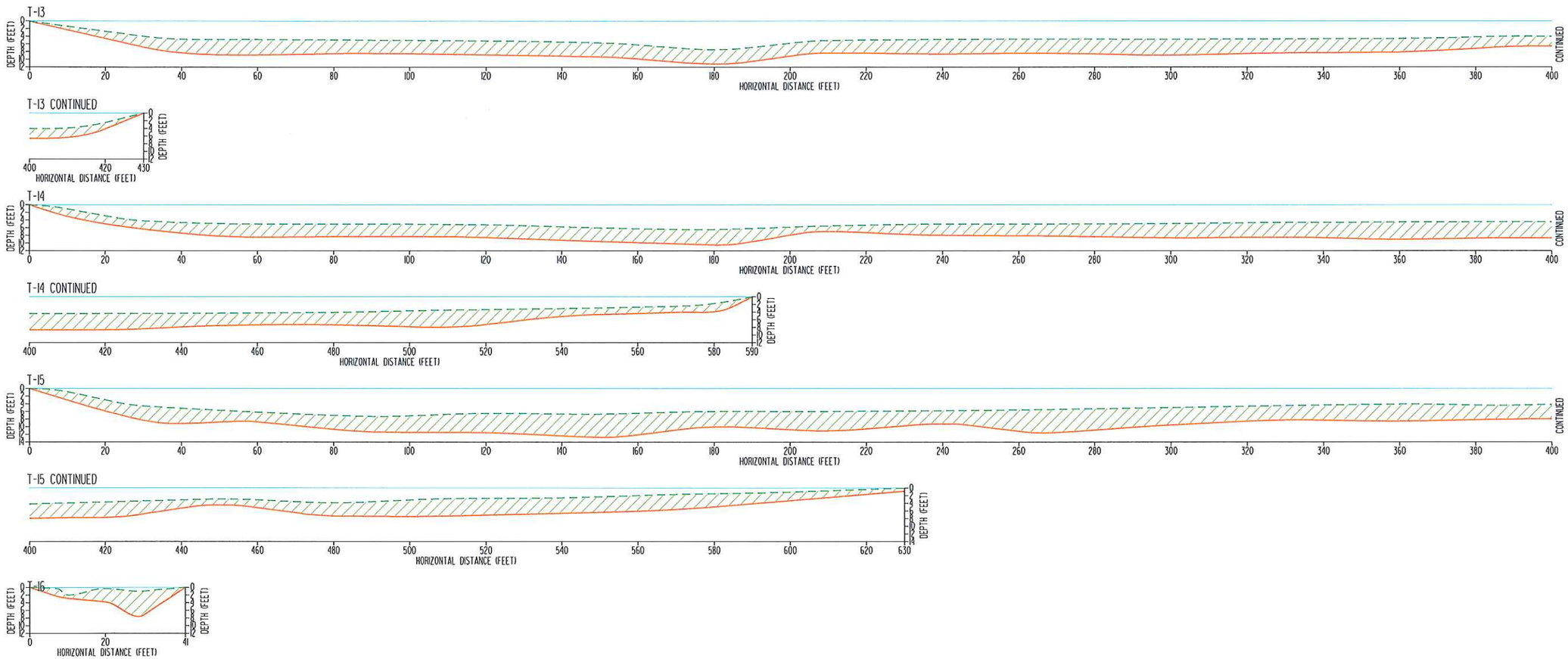

FIG. 5

TITLE: LAKE SEDIMENT CROSS SECTIONS
GARRETT LAKE
MOUNTAIN PARK, FULTON COUNTY, GEORGIA

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PROJECT NO: 2016.5869.01

REVISIONS:

SCALE: 1" = 30'

DATE: 11-14-16

DRAWN: VPV

CHECKED: MGA

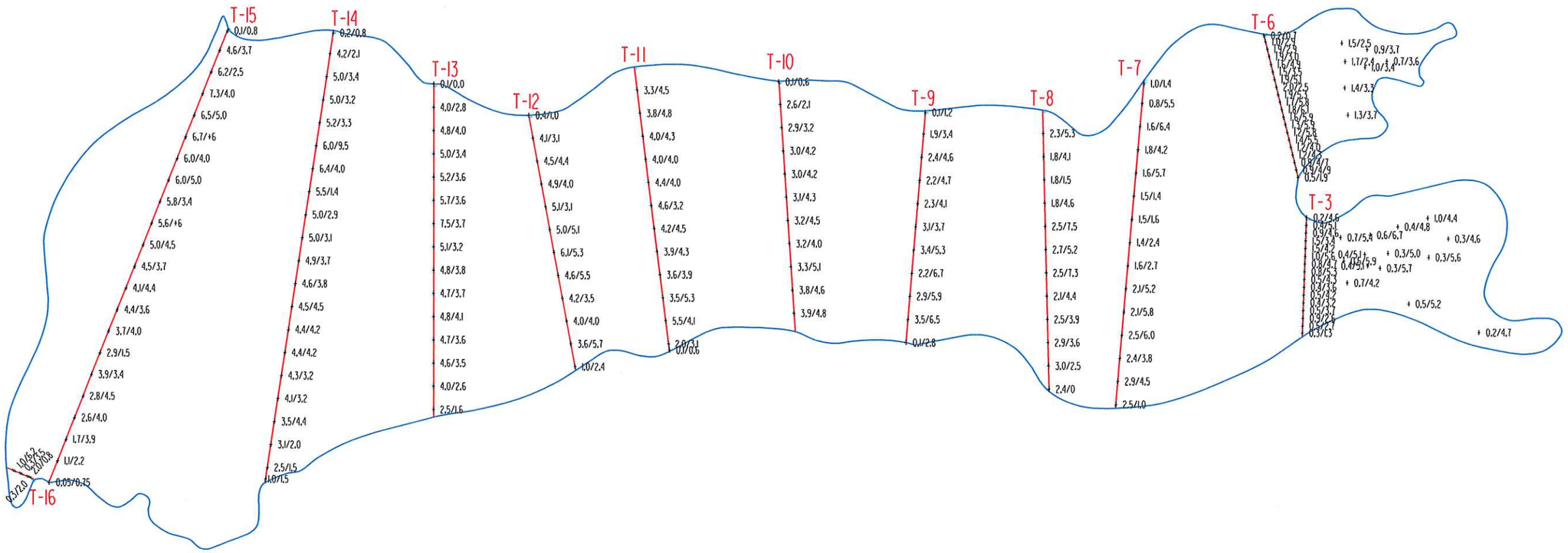
CLIENT: CITY OF MOUNTAIN PARK

LEGEND

APPROXIMATE EXTENT OF LAKE

APPROXIMATE LOCATION OF TRANSECT

+ 0.0/0.0 DEPTH TO TOP OF SEDIMENT/SEDIMENT THICKNESS (FEET)



NOTE:
ALL MEASUREMENTS ARE LISTED IN FEET.

FIG. 6

TITLE: LAKE SEDIMENT DEPTH/THICKNESS
GARRETT LAKE
MOUNTAIN PARK, FULTON COUNTY, GEORGIA

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PROJECT NO: 2016.5869.01

REVISIONS:

DATE: 11-1-16

CHECKED: MGA

SCALE: ±1" = 150'

DRAWN: VPV

CLIENT: CITY OF MOUNTAIN PARK

LEGEND

- APPROXIMATE EXTENT OF LAKE
- APPROXIMATE LOCATION OF TRANSECT
- TOP OF SEDIMENT CONTOUR

NOTE:
TOPOGRAPHIC LINES ARE LISTED IN FEET BELOW WATER SURFACE (0').

FIG. 7

TITLE: LAKE SEDIMENT TOPOGRAPHY - TOP OF SEDIMENT
GARRETT LAKE
MOUNTAIN PARK, FULTON COUNTY, GEORGIA

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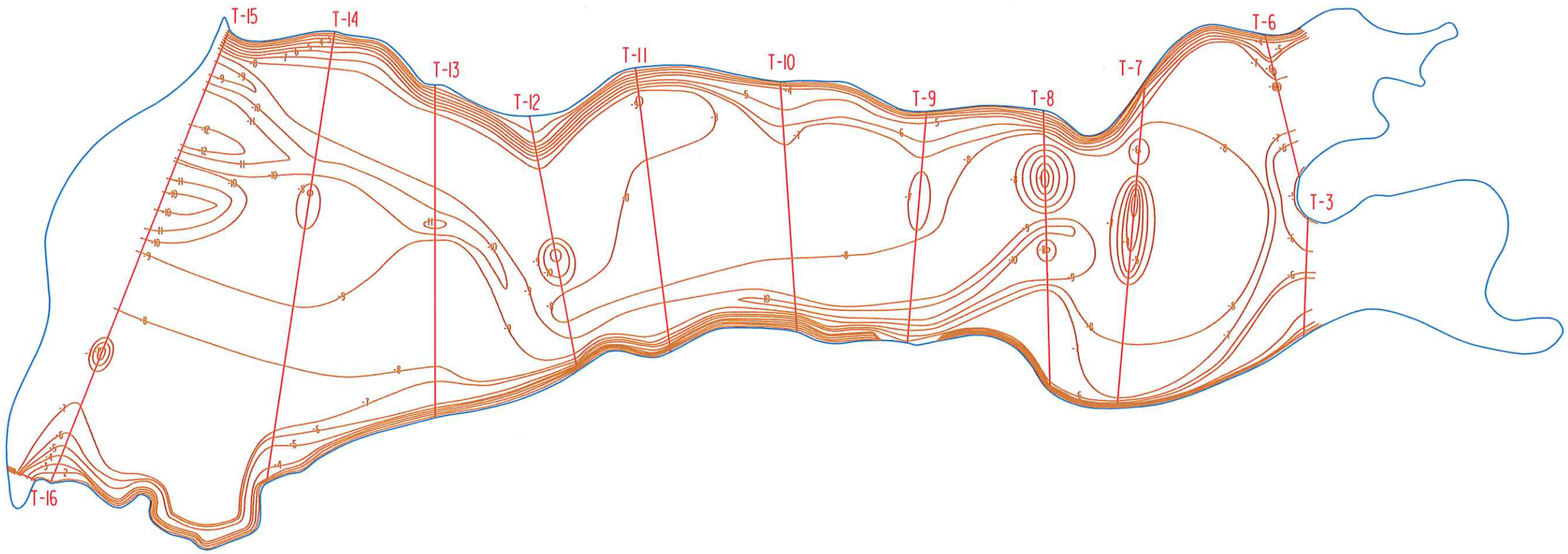
SCALE: ±1" = 150'	DATE: 11-1-16	PROJECT NO: 2016.5869.01	
DRAWN: VPV	CHECKED: MEA	REVISIONS:	

CLIENT: CITY OF MOUNTAIN PARK

LEGEND

- APPROXIMATE EXTENT OF LAKE
- APPROXIMATE LOCATION OF TRANSECT
- HARD BOTTOM CONTOUR



NOTE:
TOPOGRAPHIC LINES ARE LISTED IN FEET BELOW WATER SURFACE (0').

FIG. 8

TITLE: LAKE HARD BOTTOM TOPOGRAPHY
GARRETT LAKE
MOUNTAIN PARK, FULTON COUNTY, GEORGIA

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PROJECT NO: 2016.5869.01
REVISIONS:

SCALE: 1" = 150'
DATE: 11-1-16
DRAWN: VPV
CHECKED: MCA

CLIENT: CITY OF MOUNTAIN PARK

Photo # 1: Eastern end of the lake, where the water was the shallowest.

Photo # 2: Additional view of the shallow, eastern end of the lake.

Photo # 3: View of the lake, near T-13, looking northwest.

Photo # 4: View of thick vegetation, which was accumulated near the eastern end of the lake.

Photo # 5: View looking towards the dam of the lake.