

November 19, 2010

Mr. Thomas M. Hamel  
Chief Operator  
Water Pollution Control Department  
80 Medina Street  
Chicopee, MA 01013-1041

**Subject: Work Plan for Borehole Backfilling  
Former Facemate Facility  
Chicopee Falls Levee System Right-of-Way**

Dear Mr. Hamel:

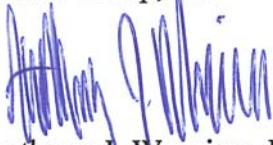
Pursuant to guidance from Nat Arai GZA GeoEnvironmental, Inc., and on behalf of the Chicopee Office of Community Development, BETA Group, Inc. respectfully requests that you forward the above-referenced Work Plan to the Corps of Engineers for review and final approval.

We have enclosed three (3) copies of the plan; please let us know if you require additional copies.

If we can be of any further assistance regarding this matter, please contact Alan Hanscom or me.

Sincerely,

BETA Group, Inc.



Anthony J. Wespiser, P.E.  
Senior Project Manager

cc: Carl Dietz, Chicopee Office of Community Development  
Nathaniel Y. Arai, P.E. of GZA GeoEnvironmental, Inc.  
Alan D. Hanscom, LSP, BETA Group, Inc.

# Work Plan

## Borehole Backfilling Within Chicopee Falls Levee System Right-of-Way

---

Former Facemate Corporation Facility  
5 West Main Street  
Chicopee, Massachusetts 01020

---

November 16, 2010

*Prepared for Submittal to:*

United States Army Corps of Engineers  
696 Virginia Road  
Concord, MA 01742-2751

*Prepared on Behalf of:*

City of Chicopee  
Office of Community Development  
38 Center Street  
Chicopee, Massachusetts 01020

*Prepared by:*

**BETA Group, Inc.**

**Engineers • Scientists • Planners**

315 Norwood Park South, Norwood, MA 02062 781.255.1982  
Lincoln, RI - Rocky Hill, CT email: BETA@BETA-inc.com

## Table of Contents

1.0	Introduction.....	1
2.0	Summary of Work Completed to Date .....	2
3.0	Corrective Actions at SB-11 .....	2
4.0	As-Built Plan.....	3
5.0	Future Subsurface Activities.....	3

### Figures

- 1 Site Locus Map
- 2a Site Plan: U.S. Army Engineer Division Drawing Number CT-5885 Sheet 2
- 2b Site Plan: Blow-up of Portion of Figure 2b

### Appendices

- A Soil Boring Logs

## 1.0 Introduction

On behalf of the Chicopee Office of Community Development (OCD), BETA Group, Inc. (BETA) has prepared this Work Plan for the backfilling of up to two boreholes recently installed within or near the right-of-way of the Chicopee Falls Levee System at the former Facemate Facility property located at 5 West Main Street in Chicopee, Massachusetts. It is also intended that this Work Plan will define a protocol for communicating and coordinating prior approval of future activities within that right-of-way.

BETA is under contract with the City of Chicopee to provide Licensed Site Professional (LSP) and related services in to identify and assess environmental conditions at the Former Facemate Facility and Uniroyal properties (the “Site”). BETA will also be providing LSP services related to remediation (and clean-up) activities.

BETA understands that the United States Army Corps of Engineers (USACE) maintains jurisdiction over, and oversees operation and maintenance of, the Chicopee Falls Levee System. The Chicopee Falls project provides flood protection for the area of Chicopee along the right (north) bank of the Chicopee River about two miles upstream from the mouth of the river (Chicopee Falls). The project consists of about 4,800 feet of levees and walls, two pressure drains for discharging high level interior drainage, and two pumping stations for storm water. The Chicopee Falls project was built following the Chicopee River flood of August 1955. Construction was started in October 1963 and completed in July 1965.

USACE has jurisdiction over the levee system and approval from USACE is required prior to conducting certain activities within the levee right-of-way.

Numerous sources of both oil and hazardous material have been present at the Site throughout its industrial history, including large capacity underground storage tanks containing #6 fuel oil, above-ground storage tanks containing hydrogen peroxide and muriatic acid, and both non-PCB and PCB-containing transformers. Soil contamination identified to date includes PCBs, heavy metals, Polynuclear Aromatic Hydrocarbons (PAHs), Volatile Organic Compounds (VOCs), and petroleum hydrocarbons.

BETA is currently undertaking supplemental site investigations to help assess the nature and extent of environmental contamination at the Site that may represent significant risk to human health, safety and/or the environment. Those supplemental investigation activities include, among other things, subsurface explorations (drilling of soil borings, installation of monitoring wells, excavation of test pits, etc.), some of which will need to be within or in close proximity to the right-of-way of the Chicopee Falls Levee System. As of the date of this Work Plan, BETA subsurface investigation has occurred at only one location (SB-11) that is within 50 feet of the toe of the levee.

The full extent and location of remediation activities is not currently known, but will be dependent on the findings of the ongoing investigations. BETA is currently in the design phase of a project to remove underground storage tanks (USTs) located in the inner (northwest) corner of the “elbow” formed by Buildings 1 and 5 as shown on the USACE Drawing Number CT-5885 Sheet 2 (June 1963 Corps Chicopee Falls Flood Control Plans). There are three USTs to be removed, none of which is proximate to the levee; the nearest tank to the levee is approximately 70 feet to the south of the 24-inch R.C.P. interceptor drain and approximately 90 feet to the south of the toe of the levee. Despite the buffer distance to the levee, the Contract Documents for the UST removal project will include notification to the contractor of the levee system, define a limit of work that provides a separation from the levee system (including the interceptor drain), and stipulate that the contractor’s activities are strictly prohibited beyond that limit of work.

## **2.0 Summary of Work Completed to Date**

BETA was on Site on August 26, 2010 to complete soil borings as part of the ongoing supplemental investigation. Two of these borings, SB-10 and SB-11, were completed at the western side of the property; SB-10 is approximately 50 feet east of the 18-inch R.C.P. interceptor drain (57± feet east of the toe of the levee), and SB-11 is approximately five (5) feet east of the 18-inch R.C.P. interceptor drain (18± feet east of the toe of the levee). A Site Locus is included as Figure 1 and Site Plans<sup>1</sup> are included as Figures 2a and 2b (see figure 2a for boring locations). The borings were drilled using 4-3/8 inch (ID) hollow stem augers with a 140-pound hammer to drive 1-3/8 inch split barrel sampler. Boring SB-10 was advanced to fourteen (14) feet below ground surface (bgs) and boring SB-11 was advanced to eighteen (18) feet bgs. Both borings were backfilled upon completion; however, the method of backfilling did not meet USACE requirements. Soil boring logs are included in Appendix A.

## **3.0 Corrective Actions at SB-11**

BETA proposes to re-drill soil boring SB-11 and backfill it in accordance with USACE Regulation ER 1110-1-1807 (Procedures for Drilling in Earth Embankments). The borehole will be re-drilled using 10-inch I.D. (inside diameter) driven casing (drive-and-wash methods) to 18 feet, the depth of the original boring. Since the 10-inch I.D. driven casings are larger than the 8-inch O.D. (outside diameter) “flight” diameter of the hollow-stem augers that were used to drill the original boring, any disturbed/loosened soil along the sidewall of the original boring will be captured and removed. Grout conforming to the requirements of USACE Engineering Manual EM 1110-2-3506 (Grouting Technology) will be injected through a tremie pipe or hose inserted

---

<sup>1</sup> The Site Plans for this Work Plan are based on the drawings entitled “Connecticut River Flood Control Project, Chicopee Falls, Mass., Plans for the Local Protection Project”, dated June 1963 (U.S. Army Engineer Division, New England, Corps of Engineers, Waltham, Mass.). Figure 2a is a reduction of Drawing Number CT-5885 Sheet 2, scaled to fit an 11 inch by 17 inch sheet. Figure 2b is a blow-up of a portion of Figure 2b; the area of coverage of Figure 2b is shown on Figure 2a.

to a depth of six (6) inches above the base of the boring. The hole will then be grouted to twelve (12) inches below the ground surface. The quantity of backfill grout will be estimated based on the depth and diameter of the bore hole prior to starting backfilling operations, and injection quantities will be monitored continuously. If the estimated quantity per linear foot of hole is exceeded significantly, operations will be halted, the casing will be pulled to the top of the grout, and the grout will be allowed to set; once the grout has set, the grouting operations will resume.

#### **4.0 As-Built Plan**

The re-drilling and grouting of each borehole will be logged; the log and an as-built plan showing the location of the grouted hole will be prepared and submitted to USACE following completion.

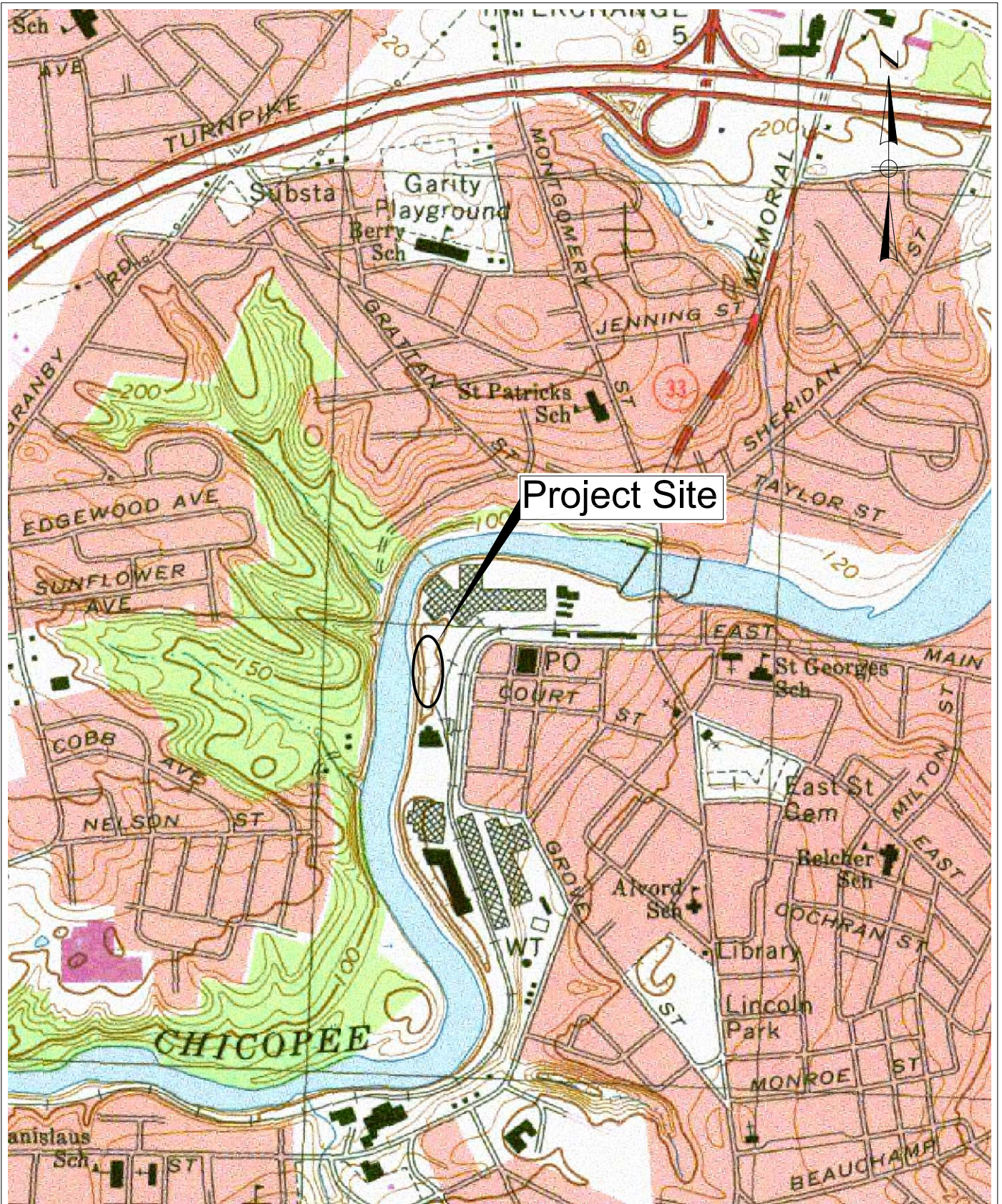
#### **5.0 Future Subsurface Activities**

As indicated above, supplemental subsurface investigation (drilling of soil borings, installation of monitoring wells, excavation of test pits, etc.) and remediation activities will be ongoing at the Site; some of those activities will need to be within or in close proximity to the right-of-way of the Chicopee Falls Levee System.

Prior to commencing any future activities within the right-of-way, an activity-specific work plan will be prepared and submitted for review and approval by USACE. Such work plans will be submitted at least two weeks prior to the date the activities are scheduled to start, and will be submitted to USACE, with a copy to Thomas M. Hamel, Chief Operator of the Chicopee Water Pollution Control Department.

Each work plan will be presented following a brief report format, including a locus figure and a description of the specific proposed activity. When applicable, test holes/test pits will be logged, as will grouting/backfill, and as-built plans will be prepared and submitted to USACE following completion.

## **FIGURES**

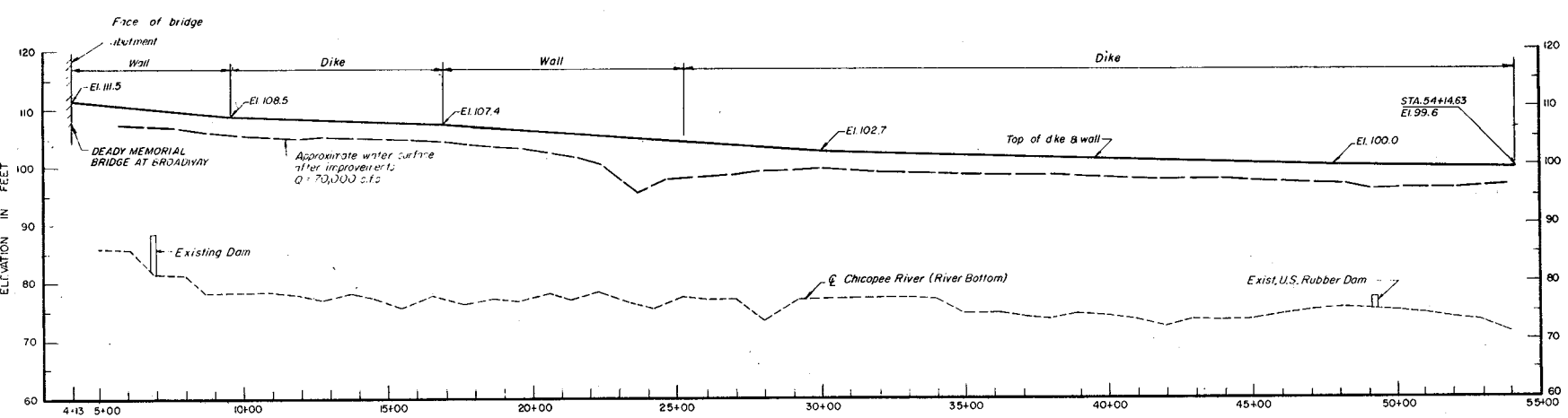


**BETA Group, Inc.**  
 Engineers • Scientists • Planners  
 315 Norwood Park South  
 Norwood, MA 02062  
 781.255.1982  
 email: BETA@BETA-inc.com

Work Plan  
 Borehole Backfilling  
 Facemate Facility  
 Subsurface Investigations  
 Chicopee Falls, Massachusetts

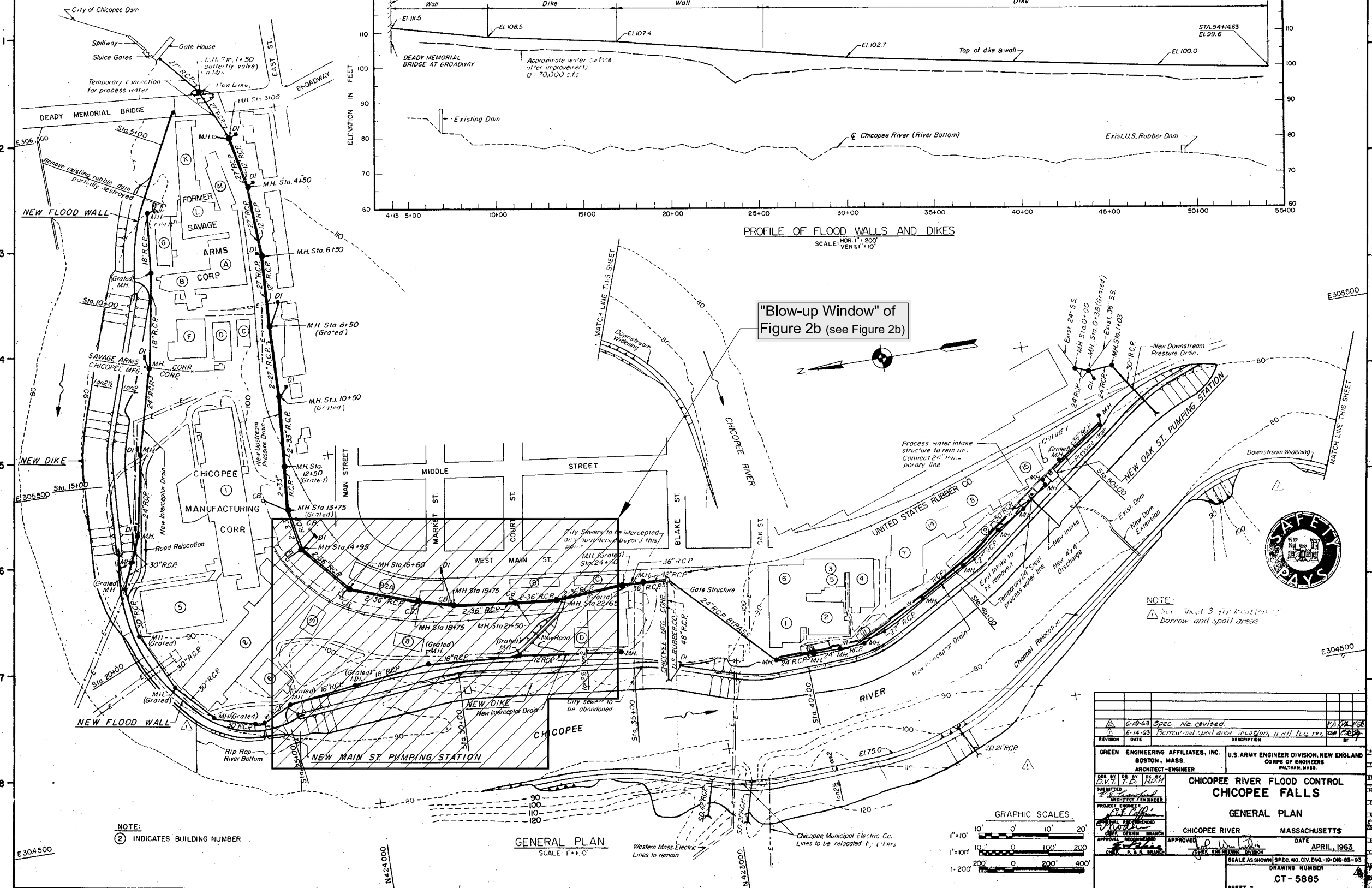
Figure 1  
**Locus Plan**





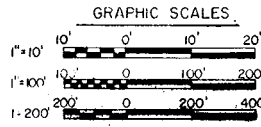
PROFILE OF FLOOD WALLS AND DIKES  
SCALE: HOR. 1" = 200'  
VERT. 1" = 10'

"Blow-up Window" of Figure 2b (see Figure 2b)



NOTE:  
② INDICATES BUILDING NUMBER

GENERAL PLAN  
SCALE: 1" = 300'

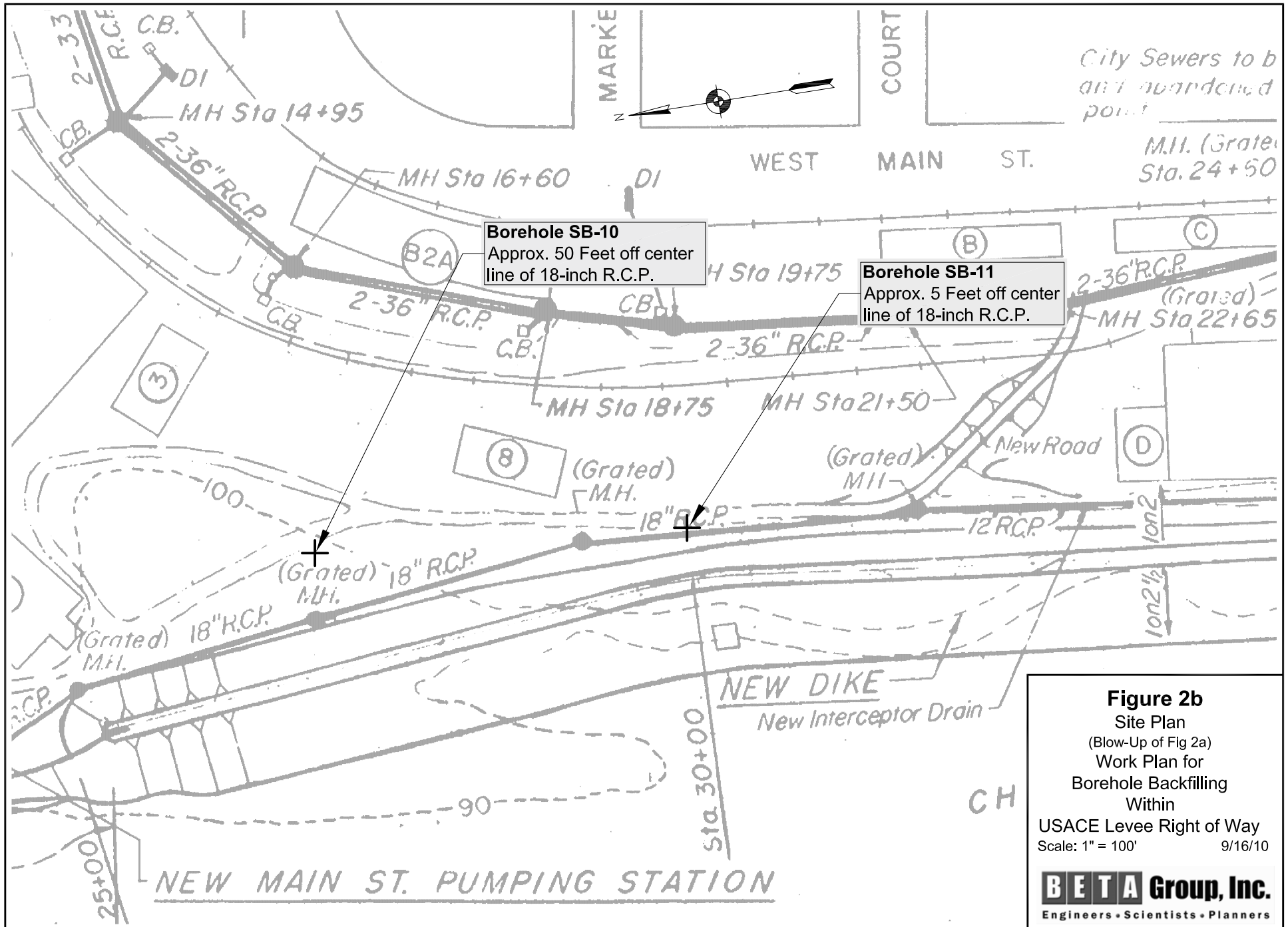


REVISION	DATE	DESCRIPTION
1	5-18-63	Spec. No. revised.
2	5-18-63	Fill area and spill area locations, wall loc. rev.

DESIGNED BY	ARCHITECT-ENGINEER	U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.
<b>CHICOPEE RIVER FLOOD CONTROL CHICOPEE FALLS</b>		
GENERAL PLAN		
PROJECT ENGINEER	CHICOPEE RIVER	MASSACHUSETTS
APPROVED	DATE	APRIL, 1963
SCALE AS SHOWN SPEC. NO. CIV. ENG. 19-016-08-93		
DRAWING NUMBER CT-5885		
SHEET 2		

**Figure 2a**  
Site Plan  
Work Plan for  
Borehole Backfilling  
Within  
USACE Levee Right of Way  
Scale: 1" = 300' 9/16/10



**Figure 2b**  
 Site Plan  
 (Blow-Up of Fig 2a)  
 Work Plan for  
 Borehole Backfilling  
 Within  
 USACE Levee Right of Way  
 Scale: 1" = 100' 9/16/10

**BETA Group, Inc.**  
 Engineers • Scientists • Planners

**APPENDIX A**  
**BORING LOGS**

**BETA GROUP, INC.**

**TEST BORING REPORT**

PROJECT: Facemate Property - Chicopee  
 LOCATION: Chicopee, MA  
 DRILLING CO: Technical Drilling Services  
 EQUIPMENT: HSA  
 DRILLED BY: Brett, James & Matt  
 INSPECTED BY: SJB

BORING NO. SB-10  
 PAGE 1 OF 1  
 DATE STARTED: 8/26/2010  
 DATE FINISHED: 8/26/2010  
 SURFACE ELEVATION: na

**GROUNDWATER OBSERVATIONS**

NOT ENCOUNTERED: \_\_\_\_\_

DEPTH	STABILIZATION TIME
	None

	CASING	SAMPLER	CORE BARREL
TYPE:	HSA	Split-Barrel	N/A
SIZE ID:	4-3/8"ID	1-3/8"	
HAMMER WT:		140 lb	
HAMMER FALL:		36"	

**SAMPLE DATA**

DEPTH (ft)	SAMPLING DEPTH FROM - TO	HAMMER BLOWS ON SAMPLER (inches)				STRATA CHANGE (ft)	LITHOLOGY (Description of materials)	SAMPLE ID	PEN/RECOV (in./in.)	HNU (ppm) Lamp 10.2 eV.
		0-6	6-12	12-18	18-24					
5.0	0-2	8	10	44	39		0-6" Topsoil. 6"-20" Fine to coarse grained brown and coarse angular to rounded gravel.	0-2	20/24	0.0
	2-4	18	29	27	21		0-10" Coarse grained orange/brown sand with some subrounded gravel.	2-4	10/24	0.0
	4-6	32	22	19	8		0-6" Fine to medium grained dark brown sand. Some subrounded fine gravel.	4-6	6/24	0.0
10.0	6-8	10	20	20	18		0-2" Same as above. 2"-4" Coarse grained brown sand. Quartz cobble. 4"-12" Fine grained red sand and silt. Wet.	6-8	12/24	0.0
	8-10	2	6	16	10		0-22" Redish clay with coarse angular gravel. Stiff.	8-10	22/24	0.0
	10-12	4	8	5	6		0-18" Same as above.	10-12	18/24	0.0
15.0	12-14	10	22	21	28		0-20" Same as above.	12-14	20/24	0.0
							End of Boring			
20.0										

Notes: Difficult to tell where the water table is due to the tight formation.

BETA GROUP, INC.	TEST BORING REPORT
------------------	--------------------

PROJECT: Facemate Property - Chicopee  
 LOCATION: Chicopee, MA  
 DRILLING CO: Technical Drilling Services  
 EQUIPMENT: HSA  
 DRILLED BY: Brett, James & Matt  
 INSPECTED BY: SJB

BORING NO. SB-11  
 PAGE 1 OF 1  
 DATE STARTED: 8/26/2010  
 DATE FINISHED: 8/26/2010  
 SURFACE ELEVATION: na

**GROUNDWATER OBSERVATIONS**

NOT ENCOUNTERED: \_\_\_\_\_

DEPTH	STABILIZATION TIME
	None

	CASING	SAMPLER	CORE BARREL
TYPE:	HSA	Split-Barrel	N/A
SIZE ID:	4-3/8"ID	1-3/8"	
HAMMER WT:		140 lb	
HAMMER FALL:		36"	

**SAMPLE DATA**

DEPTH (ft)	SAMPLING DEPTH FROM - TO	HAMMER BLOWS ON SAMPLER (inches)				STRATA CHANGE (ft)	LITHOLOGY (Description of materials)	SAMPLE ID	PEN/RECOV (in./in.)	HNU (ppm) Lamp 10.2 eV.
		0-6	6-12	12-18	18-24					
5.0	0-2	3	9	10	14		0-8" Topsoil. 8"-20" Fine grained dark brown sand and fine angular gravel.	0-2	20/24	0.0
	2-4	7	19	10	9		0-10" Same as above. 10"-20" Fine grained orange sand and silt.	2-4	20/24	0.0
	4-6	2	2	2	6		0-24" Fine to coarse grained orange sand. Trace silt.	4-6	24/24	0.0
10.0	6-8	6	4	2	2		0-8" Same as above. 8"-18" Medium to coarse grained brown to red sand and coarse angular gravel.	6-8	18/24	0.0
	8-10	19	17	15	19		0-6" Coarse grained orange sand and coarse gravel. 6"-12" Red clay with trace coarse sand.	8-10	12/24	0.0
	10-12	11	20	19	8		0-12" Red clay with some coarse angular gravel. Moist.	10-12	12/24	0.0
15.0	12-14	12	18	25	20		0-24" Same as above. Wet.	12-14	24/24	0.0
	14-16	22	25	22	24		0-10" Same as above.	14-16	10/24	0.0
	16-18	10	25	19	20		0-20" Same as above with a cobble of quartz.	16-18	20/24	0.0
20.0							End of Boring			

Notes: Difficult to tell where the water table is due to the tight formation.

**BETA Group, Inc.**

**Engineers • Scientists • Planners**

315 Norwood Park South, Norwood, MA 02062 781.255.1982  
Lincoln, RI - Rocky Hill, CT email: BETA@BETA-inc.com