

Work Plan

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

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

September 24, 2010
Revised: October 7, 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:

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Engineers • Scientists • Planners

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Note on Revisions:

This October 7, 2010 revision includes two modifications, summarized as follows:

1. A new sentence was added after the first sentence of Section 3.0 “Corrective Actions at SB-11” to clarify the diameter and the depth of the re-drilled hole.
2. The word “backfilling” in last sentence of Section 3.0 was replaced with “grouting” to clarify that the grouting operation will resume under the given circumstances.

DRAFT

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 Plans¹ 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 a 4–3/8 inch ID (inside diameter) hollow stem auger setup to a depth of 18 feet (the same drilling setup and depth of the original boring). 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 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

¹ 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 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 backfilling 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

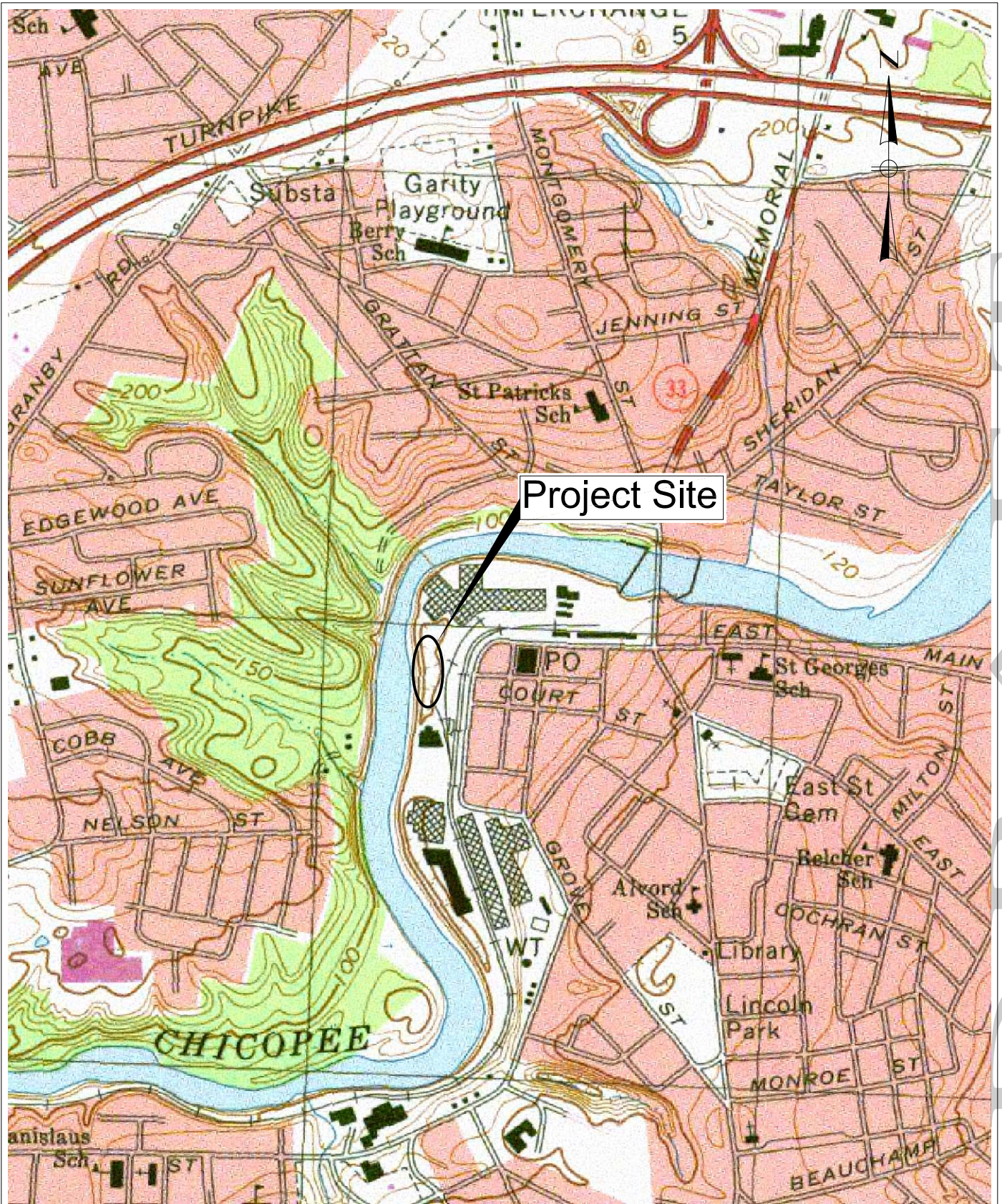
As indicated above, supplemental subsurface investigation (drilling of soil borings, installation of monitoring wells, excavation of test pits, etc.) and remediation activities will be ongoing at the Site; some of those activities will need to be within or in close proximity to the right-of-way of the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

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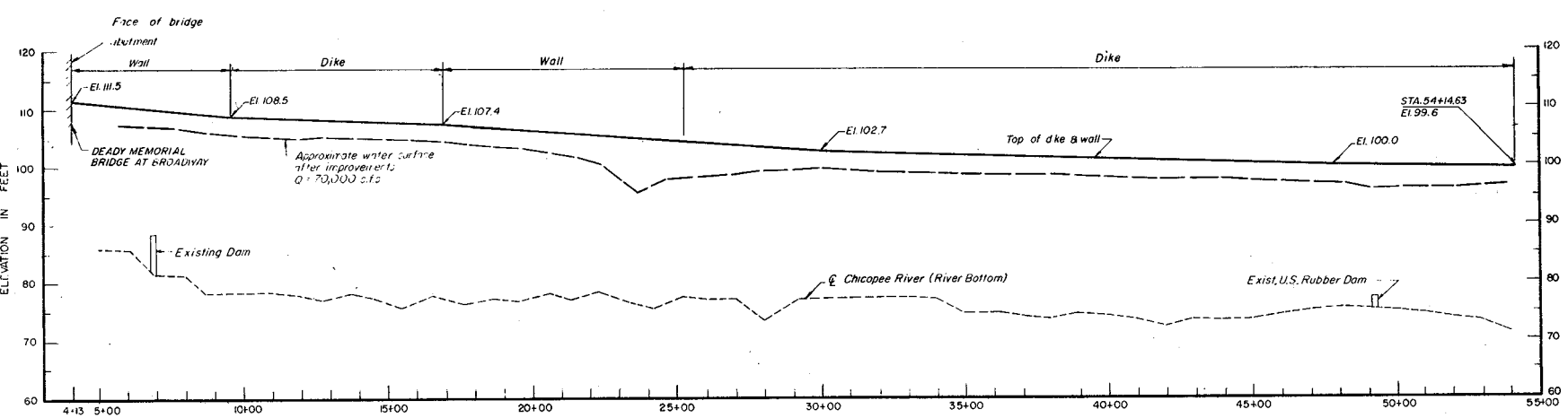
FIGURES



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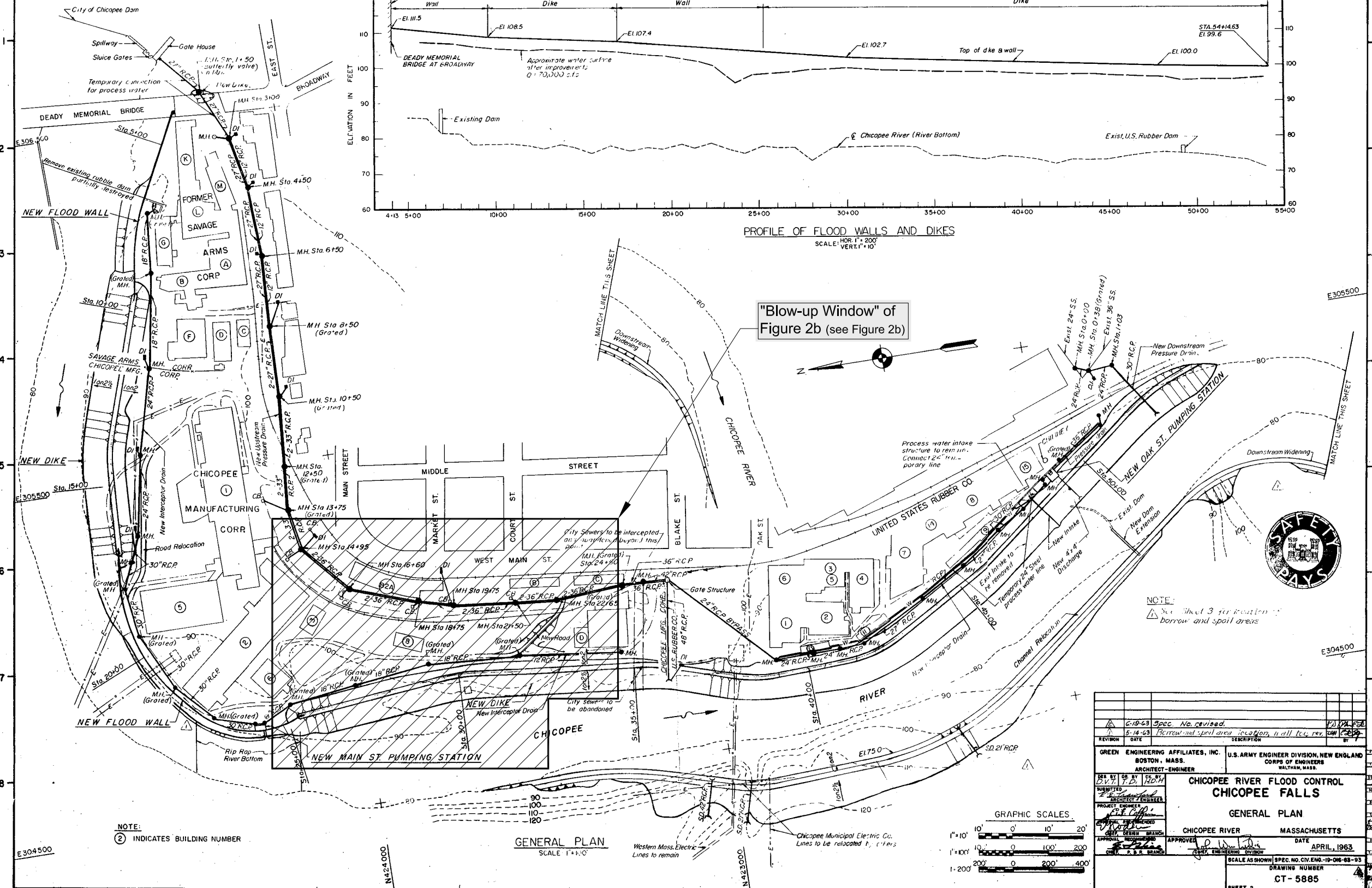
Work Plan
 Borehole Backfilling
 Facemate Facility
 Subsurface Investigations
 Chicopee Falls, Massachusetts

Figure 1
Locus Plan



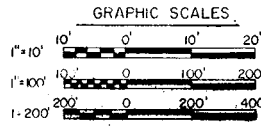
PROFILE OF FLOOD WALLS AND DIKES
SCALE: HOR. 1" = 200'
VERT. 1" = 10'

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



NOTE:
② INDICATES BUILDING NUMBER

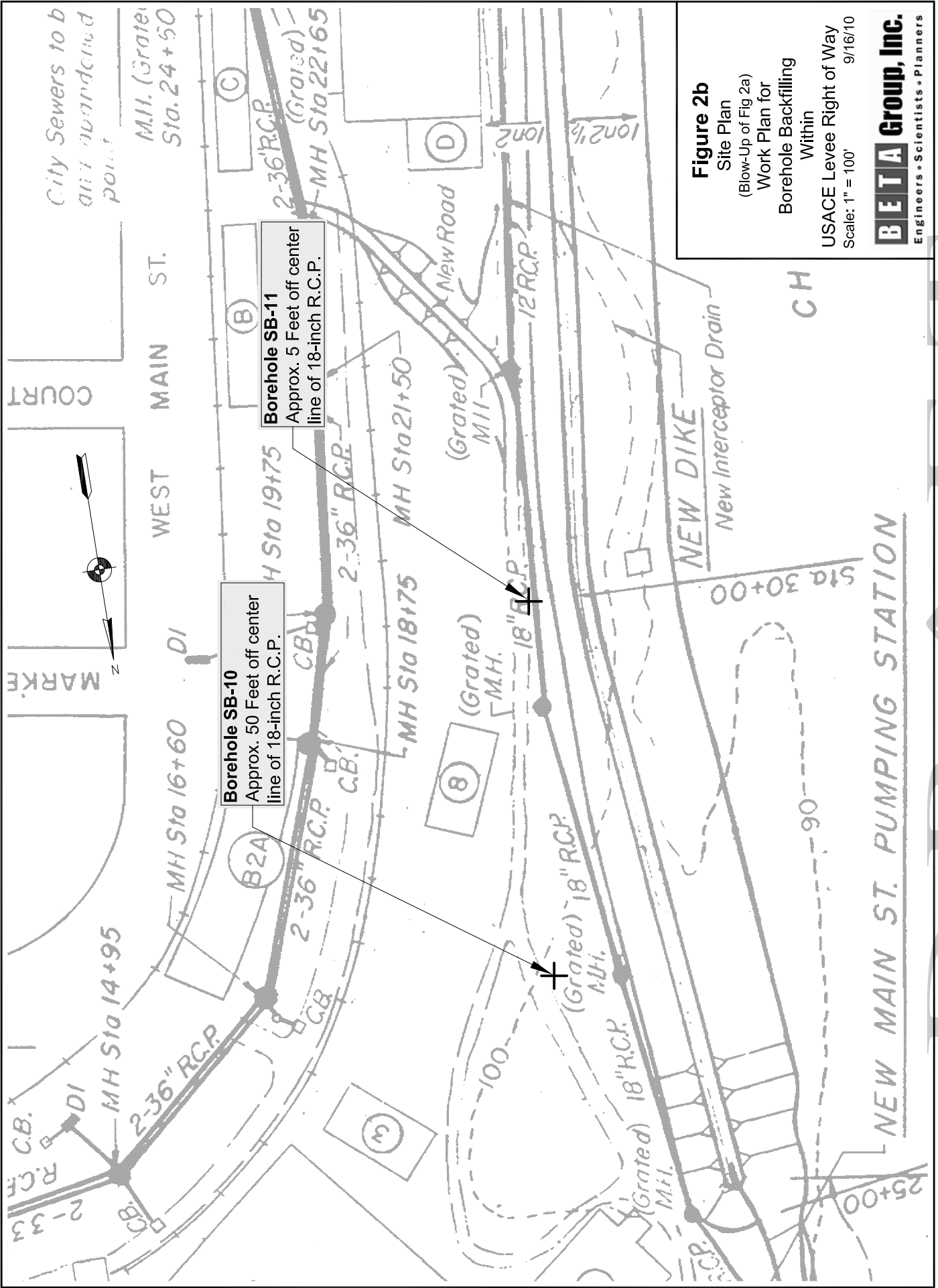
GENERAL PLAN
SCALE 1" = 300'



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

DESIGN BY	ARCHITECT-ENGINEER	U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.
PROJECT ENGINEER	CHICHOPEE RIVER FLOOD CONTROL CHICHOPEE FALLS GENERAL PLAN	CHICHOPEE 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



City Sewers to be
and awarded

M.H. (Grated)
Sta. 24+50

Borehole SB-11
Approx. 5 Feet off center
line of 18-inch R.C.P.

Borehole SB-10
Approx. 50 Feet off center
line of 18-inch R.C.P.

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



NEW MAIN ST. PUMPING STATION

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

TYPE: HSA CASING HSA SAMPLER Split-Barrel CORE 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

TYPE: HSA CASING HSA SAMPLER Split-Barrel CORE 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.

D R A F T

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Engineers • Scientists • Planners

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