SDMS: 160600

01-0464

Corporate Environmental Programs
General Electric Company
100 Woodlawn Avenue, Pittsfield, MA 01201

March 21, 2002

Dean Tagliaferro
On-Scene Coordinator
U.S. Environmental Protection Agency
c/o Weston Environmental Engineering
One Lyman Street
Pittsfield, MA 01201

Re: GE Pittsfield/Housatonic River Site
Upper ½-Mile Reach Removal Action (GECD800)
2001 Annual Monitoring Report Addendum

Dear Mr. Tagliaferro:

The General Electric Company (GE) has completed the 2001 monitoring events in general accordance with the requirements of the *Removal Action Work Plan – Upper ½-Mile Reach of Housatonic River* (Work Plan; BBL, August 1999). This letter transmits the 2001 Annual Monitoring Report Addendum that summarizes the post-construction monitoring activities performed during 2001. The vegetative monitoring events and vegetative restoration activities conducted by GE in 2001 were previously reported in the *2001 Annual Monitoring Report: Ecological Restoration Activities: Upper ½-Mile Reach of the Housatonic River* (AMEC Earth & Environmental, Inc. December 2001). This report has been prepared as an addendum to that ecological report and includes a description of post-construction monitoring activities associated with the restored areas of the Upper ½-Mile Reach.

If you have any questions regarding the Annual Report Addendum, please feel free to contact me.

Sincerely,

Andrew T. Silfer, P.E.
GE Project Coordinator

ATS/dmn

Attachments

V:\GE_Housatonic_Upper_Half_Mile_Confidential\Reports and Presentations\2001 Annual Mon Report Add\Drafts\16321550.doc

cc: R. Bell, DEP
J. Bieke, Shea & Gardner
M. Carroll, GE*
J. Lyn Cutler, DEP (2 copies)
Mayor S. Hathaway, City of Pittsfield
C. Fredette, CDEP
R. Goff, USACE
M. Gravelding, BBL
N. Harper MA AG
H. Inglis, EPA
D. Jamros, Weston
S. Messur, BBL
K.C. Mitkevicius, USACE
T. O'Brien, EOEA
B. Olson, EPA
S. Steenstrup, DEP
A.Weinberg, DEP
D. Young, EOEA
Public Information Repositories
GE Internal Repositories

(*Cover Letter Only)

TECHNICAL REPORT

01-0464

2001 Annual Monitoring Report Addendum – Upper ½ Mile Reach of the Housatonic River

General Electric Company
Pittsfield, Massachusetts

March 2002

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Table of Contents

1. Introduction

1.1 General

This *Annual Monitoring Report Addendum* summarizes the results of various post-construction monitoring activities conducted by the General Electric Company (GE) during 2001 for the Upper ½-Mile Reach of the Housatonic River in Pittsfield, Massachusetts. These monitoring activities were conducted to evaluate certain aspects of the Upper ½-Mile Reach Removal Action being implemented by GE pursuant to the Consent Decree (CD) for the GE-Pittsfield/Housatonic River Site. These activities were performed in accordance with the requirements of the *Removal Action Work Plan for Upper ½-Mile Reach of Housatonic River* (Blasland, Bouck & Lee, Inc. [BBL], August 1999), which is part of Appendix F to the CD.

The vegetative monitoring events and vegetative restoration activities conducted by GE in 2001 on the restored banks on the Upper ½-Mile Reach were previously reported in the *2001 Annual Monitoring Report: Ecological Restoration Activities: Upper ½-Mile Reach of the Housatonic River* (AMEC Earth & Environmental, Inc., December 2001). The present report has been prepared as an addendum to that ecological report and includes a description of post-construction monitoring activities associated with the sediment cap isolation layer, potential erosion/settlement of restored bank areas, the armor stone layer, and the aquatic habitat enhancement structures. Future annual monitoring reports will be prepared as comprehensive documents including all of the above monitoring activities.

2. Sediment Cap Isolation Layer Monitoring

2.1 General

Periodic sampling of the sediment cap isolation layer is required to monitor its long-term effectiveness in controlling polychlorinated biphenyl (PCB) migration from the underlying sediment. During 2001, monitoring of the isolation layer was performed by sampling at four of the six locations specified in the Upper ½ Mile Reach Removal Action Work Plan and at one additional location selected by the U.S. Environmental Protection Agency (EPA). The five locations that were sampled in 2001 are shown on Figure 2-1.

2.2 Monitoring Activities

The isolation layer monitoring program consists of periodic sampling of the isolation layer at select locations along the Upper ½-Mile Reach. The objective of the monitoring program is to generate data for each location during different time periods to be compiled into a database for long-term evaluation. As part of the monitoring program, sampling activities include collecting one residual sediment sample from beneath the isolation layer monitoring location immediately following excavation activities (prior to restoration), collecting baseline samples of the isolation layer shortly after cap placement, collecting samples one year after cap placement, and collecting samples at the end of the initial five-year period after cap placement.

Monitoring activities for the sediment cap isolation layer begin with post-excavation sampling of the existing river sediments prior to cap placement to confirm that detectable PCBs were present in the remaining sediments, and to provide data for use in subsequent evaluations. For this sampling, a sample of the post-excavation, pre-restoration surface sediment (0- to 2-inch increment) is obtained and analyzed for PCBs.

After the post-excavation sediment samples are collected, restoration activities for the cell are initiated, with placement of the isolation sand layer. Following placement of the isolation sand layer, samples of the sand are collected to provide baseline data for long-term monitoring. After 1 year, additional samples are collected at the same location to provide 1-year data for inclusion in the database and future evaluation. At the end of the initial five-year period after cap placement, samples are to be collected to provide additional data for the database and to assess the isolation layer's effectiveness in controlling PCB migration from the underlying sediments.

During 2001, the post-excavation and baseline sampling events were conducted at two locations (locations 4 and 5), and the 1-year monitoring event was conducted at three locations (locations 1, 2, and 3) at which the post-excavation and baseline sampling had been conducted in 2000. At each of the baseline and 1-year sampling events conducted in 2001, the overlying armor stone and newly deposited sediment in the armor stone were first removed by hand to the extent practicable and the geogrid and geotextile were temporarily cut back to allow access to the underlying isolation layer. Following this step, an undisturbed core of the sediment isolation layer was collected at each sampling location. At the time of sample collection, each core was sectioned into 2-inch increments. Consistent with the requirements of the Upper ½-Mile Reach Work Plan, the core segment intervals that measured 2 to 4, 4 to 6, and 6 to 8 inches above the bottom geotextile layer were analyzed for PCBs and total organic carbon (TOC).

The isolation layer monitoring sampling results are summarized in Table 1. Although the post-excavation and baseline sampling events for the first three monitoring locations were conducted in 2000, the results of that sampling are included in this report for completeness. The sampling summary in Table 1 includes the cell

sample location, sample ID, sample date, depth interval for each sample, and sample results for PCB and TOC analysis. The post-excavation residual sediment sampling at the five monitoring locations indicated PCB concentrations ranging from 1.72 to 519 parts per million (ppm). The baseline isolation layer monitoring performed at the five monitoring locations shortly following isolation layer placement showed the following results:

- PCBs were not detected in any samples except two, which were reported as estimated values below the practical quantitation limit; and
- TOC levels in the baseline samples collected in 2001 ranged from below detection to 2.7 percent with an average of 0.8 percent. For the three locations at which the baseline sampling was conducted in 2000, the baseline TOC results were not reported due to laboratory quality assurance/quality control problems.

The 1-year isolation layer monitoring sampling that was performed at three locations showed the following results for the isolation layer material:

- PCBs were not detected in any samples except two, which were reported at levels less than 0.1 ppm (slightly above the detection limit); and
- TOC ranged from 0.07 to 0.15 percent.

It should also be noted, however, that at these three locations, considerable newly deposited natural sand material had accumulated within the armor stone layer. Sampling of the surficial sediments upstream of the Upper ½ Mile Reach, primarily by EPA, indicated the TOC levels in these sediments were approximately 2.8%. Including this natural material (with a TOC concentration of 2.8%) in the modeling calculations regarding PCB "breakthough" times, which were originally presented in the Upper ½ Mile Reach Removal Action Work Plan, would result in a predicted "breakthrough" time of approximately 500 years, which is approximately four times higher than the "breakthrough" time predicted in the Work Plan.

3. Restored Bank Areas and Armor Stone Layer Monitoring

3.1 General

The integrity of the cleared and restored bank areas of the Upper ½-Mile Reach, excluding the approximately 170-foot-long section excavated and restored as part of the Building 68 Removal Action, is required to be monitored for five years after project completion. The monitoring program is to consist of visual inspections of the cleared and restored bank after each storm and high-water event (i.e., a flow of 440 cfs or greater at Coltsville gauging station) until herbaceous cover is established, on a semi-annual during the first year after the cover is installed, and annually in years two through five. During 2001, the restored banks were monitored initially during the spring. In addition, observations were made at various times throughout the year during implementation of the Upper ½-Mile Reach Removal Action. In areas where visual observations indicated a significant amount of erosion (e.g., ruts, gullies, washouts, or sloughing) within the cleared or restored areas or rip-rap bank protection, GE implemented and completed measures to replace/restore the eroded soil or rip-rap to the original restoration design conditions.

The armoring layer of stone placed over the isolation layer within the river bed must also be monitored periodically to ensure that it is effectively preventing erosion of the underlying sediment cap isolation layer. The monitoring program is to consist of visual inspections of the Upper ½-Mile Reach following the first ice-out and high-water condition (i.e., a flow of 440 cfs or greater reported at the Coltsville gauging station), and once per year for five years during low-flow conditions. Observations are made to determine if significant movement of the armor stone, or reduction in the armor stone thickness, has occurred. During 2001, monitoring activities for the armor stone layer were performed in conjunction with the monitoring event for the restored bank areas, as well as through observations made during the course of the Removal Action, including during low-flow conditions.

3.2 Monitoring Activities

3.2.1 Restored Bank Areas

During 2001, a bank inspection was performed on May 2, 2001, following the first ice-out and high-water condition. In addition, observations were made at various times throughout the year while implementing the Removal Action. Results of the spring monitoring and maintenance activities were presented in a letter report entitled *Erosion Inspection Monitoring and Maintenance Report* (BBL, 2001). The letter report is provided as Attachment A. Results of additional monitoring and maintenance activities performed as a result of observations made during the Removal Action were presented in various monthly reports on activities at the GE-Pittsfield/Housatonic River Site. These additional monitoring and maintenance activities are summarized below, and the locations where such activities were performed are identified on Figures 3-1 and 3-2.

Area 1 (Adjacent to Cell F3)

During November 2001, a small area (approximately 10'x 10') was noted by EPA to have settled on the restored Cell F3 bank (south side). This bank area was previously restored in accordance with the Work Plan with rip-rap

for slope stabilization due to a 1:1 slope. There were no apparent signs of significant erosion at this area and no observation of soil deposition into the river. To address the settlement in this area, rip-rap was placed over the settled area and blended to grade with the existing rip-rap cover.

Area 2 (Adjacent to Cell H1)

During removal activities in Cell H1, EPA identified 3 swales that required response actions. These swales were not previously identified in the Upper ½-Mile Reach Work Plan. The swales were restored in a similar manner to the existing Upper ½-Mile Reach swales by placing geofabric over the bottoms of the swales, and installing rip-rap over the geotextile. Areas of settlement/erosion were observed at two swales in this area following completion of restoration activities. To address this observation, additional rip-rap was placed at the swales to minimize possible future erosion in these areas.

Area 3 (Adjacent to Cell H2)

During November 2001, a small area of bare ground was noted by EPA to have possibly settled on the restored Cell H2 bank (south side). There were no apparent signs of significant erosion at this area, and no soil was observed deposited in the river. Based on the observation that this area appeared to be at a similar elevation as the surrounding area, a supplemental survey was performed to record existing bank elevations. The data from the supplemental survey were compared to the data from the Cell H2 final restoration survey. No significant differences were found between the final survey data and the supplemental survey data, and therefore no response activities were performed in this area.

3.2.2 Armor Stone Layer

Monitoring activities for the armor stone layer were performed in conjunction with monitoring events for restored bank areas of the Upper ½-Mile Reach during spring 2001, as well as through other observations during the course of the Removal Action, including during low-flow conditions. During the spring 2001 monitoring event, one area at the downstream end of restored Cell G3 was observed to have significant movement of armor stone or reduced thickness of the armor stone layer. In addition, during performance of the Removal Action, an additional area between Cells F3 and G3 was identified that required further response action. A description of each of these areas along with the corresponding response actions is presented below and the locations are shown on Figure 3-1.

Area A

During the spring 2001 monitoring event, an area where the rip-rap had moved and exposed the geotextile at the downstream end of Cell G3 was observed. The movement of the rip-rap was believed to be due to the temporary constriction of the river during a flood event by the sheetpile used for sediment removal and a pipe crossing. Additional rip-rap was added to this area to restore it to original conditions.

Area B

During sediment removal activities in Cell F3, EPA observed an apparent elevation differential along the centerline sheetpile wall between Cells F3 and G3. The elevations along the centerline sheetpile wall in both cells were measured with a survey rod and a small difference was found between the two cells (Cell G3 was slightly lower than Cell F3). To address the area of settlement in Cell G3, rip-rap was added to the armor stone cap along the centerline sheetpile wall to match the restored armor stone cap elevations in Cell F3.

4. Aquatic Habitat Enhancement Structures

4.1 General

Periodic monitoring of the aquatic habitat enhancement structures is required to evaluate the structural stability of the habitat enhancement structures, the effects of these structures on aquatic habitat, and the potential for increased bank-side erosion. Such monitoring is required following the first high-flow event and following the first prolonged low-flow condition on an annual basis for 5 years. During 2001, observations of the aquatic habitat enhancement structures were performed in spring during the restored banks monitoring event following a high-flow period. In addition, observations were made at various times throughout the year during implementation of the Removal Action, including following periods of low flow.

4.2 Monitoring Activities

The installed habitat enhancement structures which were monitored during 2001 along the Upper ½-Mile Reach include a wing deflector, habitat enhancement boulders, a w-weir, and a portion of a vortex weir. The approximate location of each habitat enhancement structure is presented on Figure 4-1. Each structure, along with corresponding observations, is described below.

The single-wing deflector is located on the south side of the river, downstream of the Newell Street Bridge, and was observed to be structurally stable with no apparent change in the location of the boulders. The wing deflector perimeter is composed of 1- to 2-foot-diameter cobbles, and the interior is filled with 6- to 9-inch-diameter stones to form a triangular shaped deflector with the base along the south bank and the apex directed toward the middle of the river. No bank erosion was noted along the bank adjacent to the deflector following high-flow events. In addition, the bank opposite (north side) the deflector, and the island located near midstream, did not exhibit signs of erosion. With respect to effects of this structure on aquatic habitat, the deflector appeared to be functioning as anticipated in the Work Plan.

A total of 38 habitat enhancement boulders had been placed in the Upper ½-Mile Reach through the end of 2001. At the request of the EPA and the Massachusetts Executive Office of Environmental Affairs (EOEA), several of the boulders were placed in different locations from those identified in the Work Plan. Figure 4-1 presents the "as-built" locations of the boulders.

During the spring 2001 inspection, as well as various other times during the year, the observations of these boulders provided no indication that the boulders were structurally unstable or had changed in location. In addition, no erosion was noted along the banks near any of the boulders. With respect to effects of these boulders on aquatic habitat, the boulders appeared to be functioning as anticipated in the Work Plan.

The rock w-weir was installed downstream from the location planned in the Work Plan (with EPA and EOEA approval). This w-weir was constructed with 2- to 3-foot-diameter boulders at the apexes (three apexes pointing upstream and two apexes pointing downstream) and 1-foot-diameter cobbles along the legs of the weir. During the various inspections, observations provided no indication that the w-weir was structurally unstable or had changed in location. In addition, no bank erosion was noted on the north and south banks adjacent to the w-weir following high-flow events. With respect to effects of this structure on aquatic habitat, the w-weir appeared to be functioning as anticipated in the Work Plan.

The vortex weir was also installed downstream of the location planned in the Work Plan (with EPA and EOEA approval). During 2001, only the southern half was installed. This vortex weir was constructed with 2- to 3-foot-diameter boulders at the apex (pointing upstream) and at the banks, and 1-foot-diameter cobbles along the legs of the weir. Since the installation of the vortex weir was not completed in 2001, inspection/observations were not performed in 2001.

5. Summary and Future Activities

5.1 Sediment Cap Isolation Layer Monitoring

During 2001, sediment cap isolation layer monitoring was performed at five locations (four work plan locations and one EPA-selected location). Post-excavation sediment samples and baseline isolation layer monitoring samples were collected at locations 4 and 5, and 1-year isolation layer monitoring samples were collected at locations 1, 2, and 3. Results of the sampling activities were summarized in Section 2 and presented in Table 2-1.

For 2002, post-excavation sediment samples and baseline isolation layer monitoring samples will be obtained at the remaining two locations specified in the Upper ½ Mile Reach Work Plan and one additional location to be selected by EPA (where sediment removal activities are to be performed in 2002). In addition, the 1-year isolation layer monitoring samples will be obtained at locations 4 and 5.

5.2 Restored Bank Area and Armor Stone Layer Monitoring

Monitoring of the restored bank area and armor stone layer was performed during spring 2001 following first ice-out and a high-flow event, and at various times during implementation of the Removal Action. The spring 2001 inspection of the restored bank areas identified four areas with evidence of measurable erosion and five other impacted areas requiring further action due to settlement or exposed sheeting (see Attachment A). In addition, during performance of the Removal Action, bank areas adjacent to Cells F3, H1, and H2 were identified for monitoring and potential maintenance associated with minor erosion or settlement, and additional rip-rap was placed over a small area adjacent to Cell F3 and in swales adjacent to Cell H1. Finally, observations of the sediment armor stone layer led to the placement of additional rip-rap in areas in Cell G3 to address erosion or settlement.

For 2002, it is anticipated that the restored banks will be monitored for potential erosion/settlement in the spring following first ice-out and a high-flow event (i.e., a flow of 440 cfs or greater at Coltsville gauging station) and in the summer during a period of low flow, as well as following each storm event and high-water condition (i.e., same flow as above). In addition, the armor stone layer will be monitored during the same spring event as the restored banks and also during low-flow conditions in the summer.

5.3 Aquatic Habitat Structures

During habitat structure inspections performed in 2001, observations of the habitat enhancement structures in the Upper ½-Mile Reach indicated no areas of unstable structures, no areas with increased bank-side erosion, and increased habitat quality for aquatic wildlife.

For 2002, it is anticipated that monitoring of the aquatic habitat structures will be performed in the spring following first ice-out and a high-flow event (i.e., a flow of 440 cfs or greater at Coltsville gauging station) and in the summer during a prolonged period of low flow.

Table

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engineers & scientists

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

HOUSATONIC RIVER UPPER 1/2 MILE REACH
Table 2-1
Isolation Layer Monitoring Sampling Summary

Sample ID	Post Excavation Sediment Results			Depth Interval	Isolation Layer Baseline Results			Isolation Layer 1-Year Results		
	Date	Depth Interval	Total PCBs		Sample Date	Total PCBs	TOC	Sample Date	Total PCBs	TOC
CAP-MON -1	6/23/00	Surface 0-2"	20	2" - 4"	11/9/00	0.027J	NR	11/5/01	ND(0.0551)	1,040
				4" - 6"	11/9/00	ND(0.038)	NR	11/5/01	0.0790	1,450
				6" - 8"	11/9/00	ND(0.040)	NR	11/5/01	ND(0.0576)	1,350
CAP-MON -2	8/17/00	Surface 0-2"	19.0	2" - 4"	11/9/00	ND(0.039)	NR	11/5/01	0.0845[0.074]	1490[1010]
				4" - 6"	11/9/00	ND(0.040)	NR	11/5/01	ND(0.0581)	897
				6" - 8"	11/9/00	ND(0.039)	NR	11/5/01	ND(0.0588)	844
CAP-MON -3	8/17/00	Surface 0-2"	1.72	2" - 4"	11/9/00	ND(0.039)	NR	11/5/01	ND(0.0570)	699
				4" - 6"	11/9/00	0.030J	NR	11/5/01	ND(0.0552)	946
				6" - 8"	11/9/00	ND(0.039)	NR	11/5/01	ND(0.0575)	1,090
CAP-MON -4	2/22/01	Surface 0-2"	519	2" - 4"	2/27/01	ND(0.0636)	15,240[10,972]	NS	NS	NS
				4" - 6"	2/27/01	ND(0.0580)	1,591			
				6" - 8"	2/27/01	ND(0.0558)	27,624			
CAP-MON -5	5/4/01	Surface 0-2"	8.46	2" - 4"	5/10/01	ND(0.0582)	ND(100)	NS	NS	NS
				4" - 6"	5/10/01	ND(0.0559)	ND(100)			
				6" - 8"	5/10/01	ND(0.0583)	6,697			

1. TOC = Total Organic Carbon
2. NS = Not sampled in 2001.
3. ND - Analyte was not detected. The value in parentheses is the associated detection limit.
4. J - Indicates an estimated value less than the practical quantitation limit (PQL).
5. PCB and TOC results presented in parts per million (ppm).
6. NR = Not reported.
7. Depth interval is measued from bottom of isolation layer.

Figures

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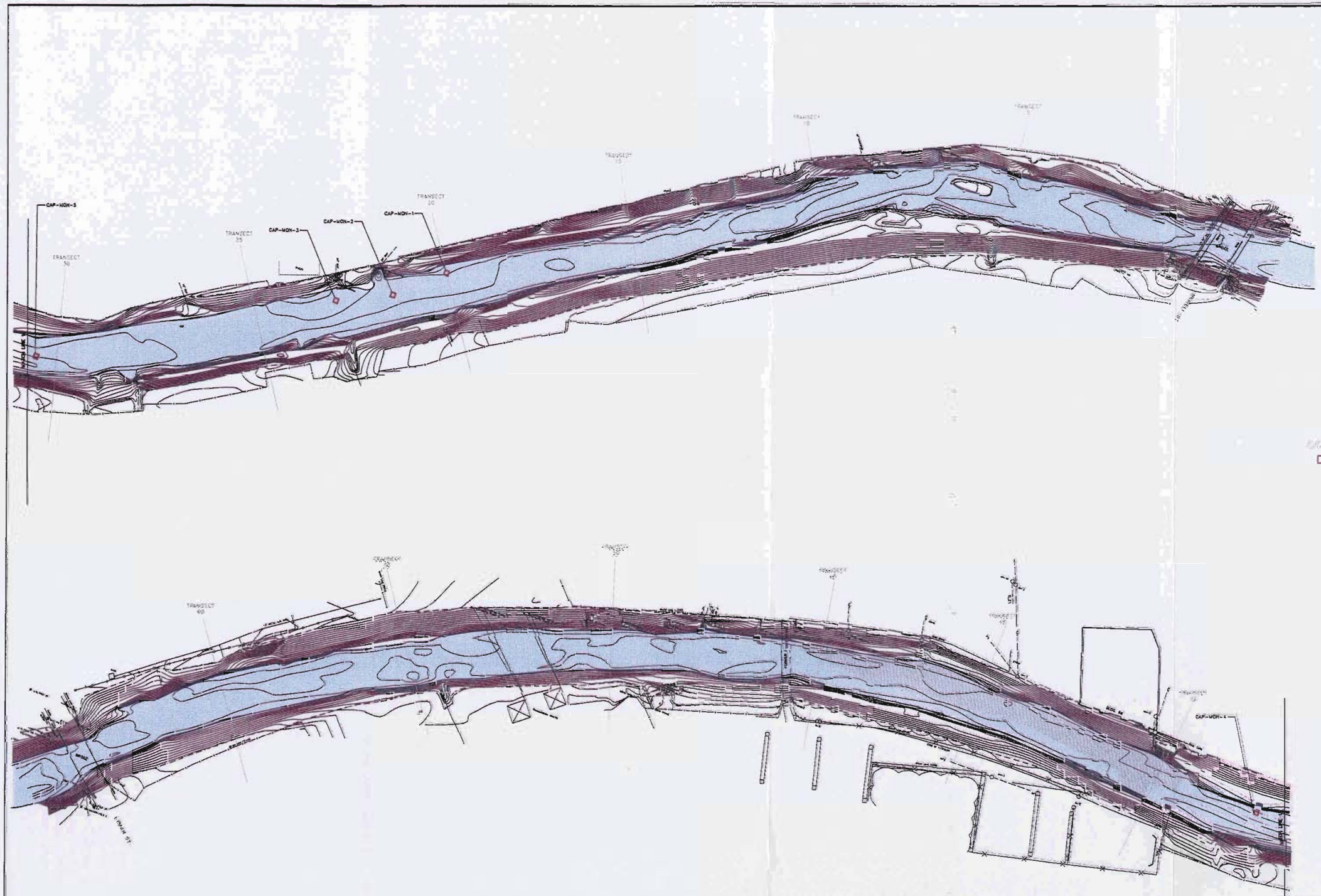


LEGEND:

BUILDING 68 REMOVAL AREA

SEDIMENT CAP ISOLATION LAYER MONITORING LOCATION

NOTES:

1. ALL LOCATIONS AND DISTANCES ARE APPROXIMATE
2. FIGURE DEPICTS ISOLATION LAYER MONITORING.

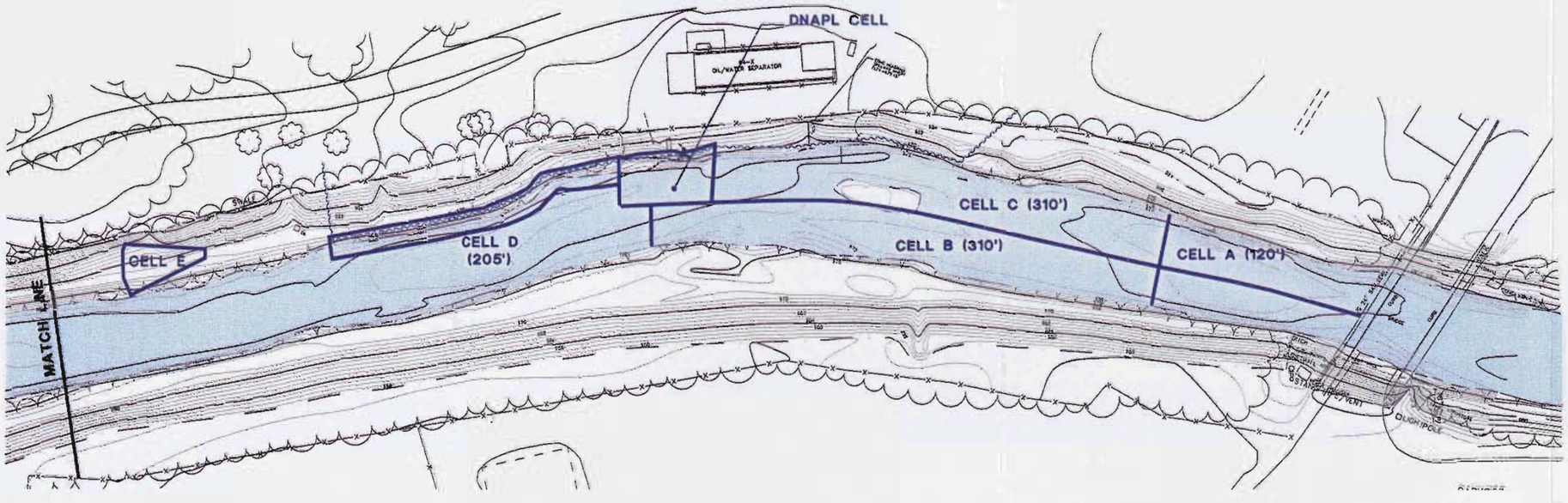
GRAPHIC SCALE

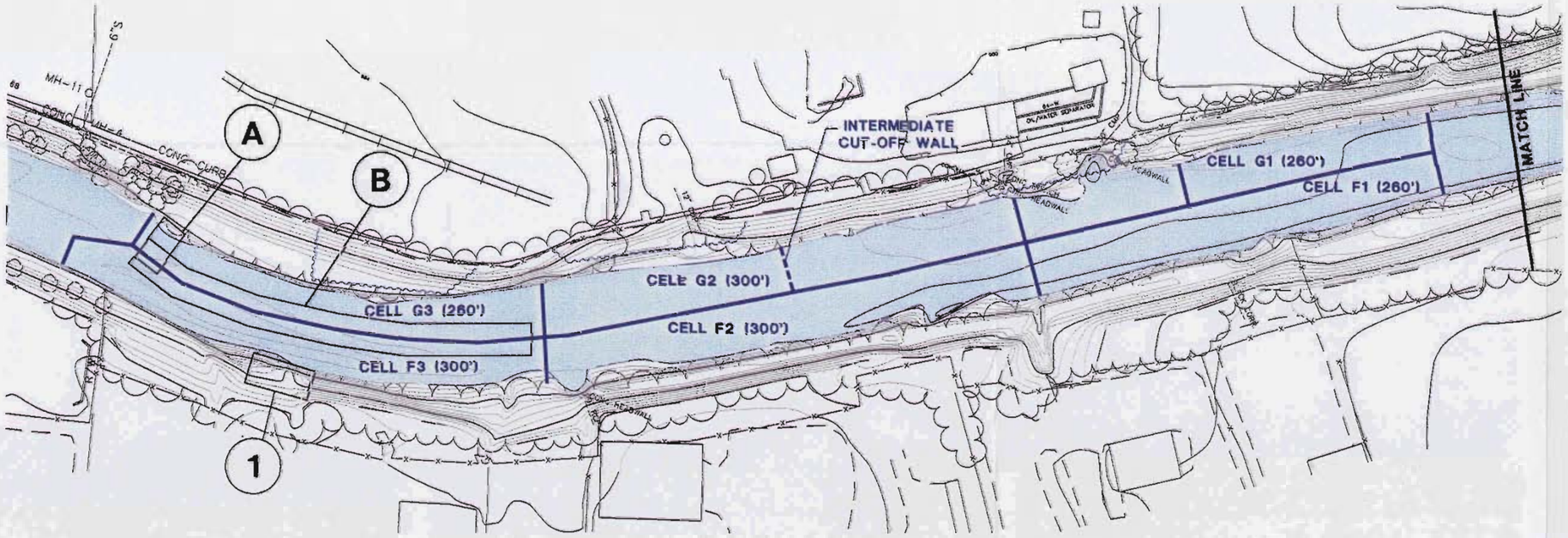
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
2001 ANNUAL MONITORING REPORT ADDENDUM
UPPER 1/2-MILE REACH OF HOUSATONIC RIVER

SEDIMENT CAP ISOLATION LAYER MONITORING LOCATIONS

BBL BEASLAND, KNIGHT & LEE, INC. ENGINEERS & SCIENTISTS

FIGURE 2-1





LEGEND:

- (1) BANK INSPECTION AREA
- (A) ARMOR STONE LAYER MONITORING AREA
- EXISTING CONTAINMENT BARRIER LOCATION
- TOP OF BANK
- REMOVAL CELL

NOTES:

1. MAPPING IS BEST AVAILABLE INFORMATION AS OF 12/10/98 BASED ON MAPPING PROVIDED BY LOCKWOOD MAPPING, INC. PREPARED FROM 1990 AERIAL PHOTOGRAPHY; DATA PROVIDED BY GENERAL ELECTRIC; AND BLASLAND AND BOUCK, P.C. CONSTRUCTION PLANS. RIVERBANK AND RIVER BED TOPOGRAPHIC INFORMATION PROVIDED BBL FROM OCTOBER 12-23, 1998 FIELD SURVEY.
2. COORDINATE GRID BASED ON 1927 STATE PLAN COORDINATES.
3. ELEVATION DATUM REFERENCED TO NGVD 1929.
4. ALL LOCATIONS AND DISTANCES ARE APPROXIMATE.

0 40' 80'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
2001 ANNUAL MONITORING REPORT ADDENDUM
UPPER 1/2-MILE REACH OF HOUSATONIC RIVER

MAINTENANCE LOCATIONS FOR RESTORED BANK AREAS AND ARMOR LAYER (CELLS A-G)

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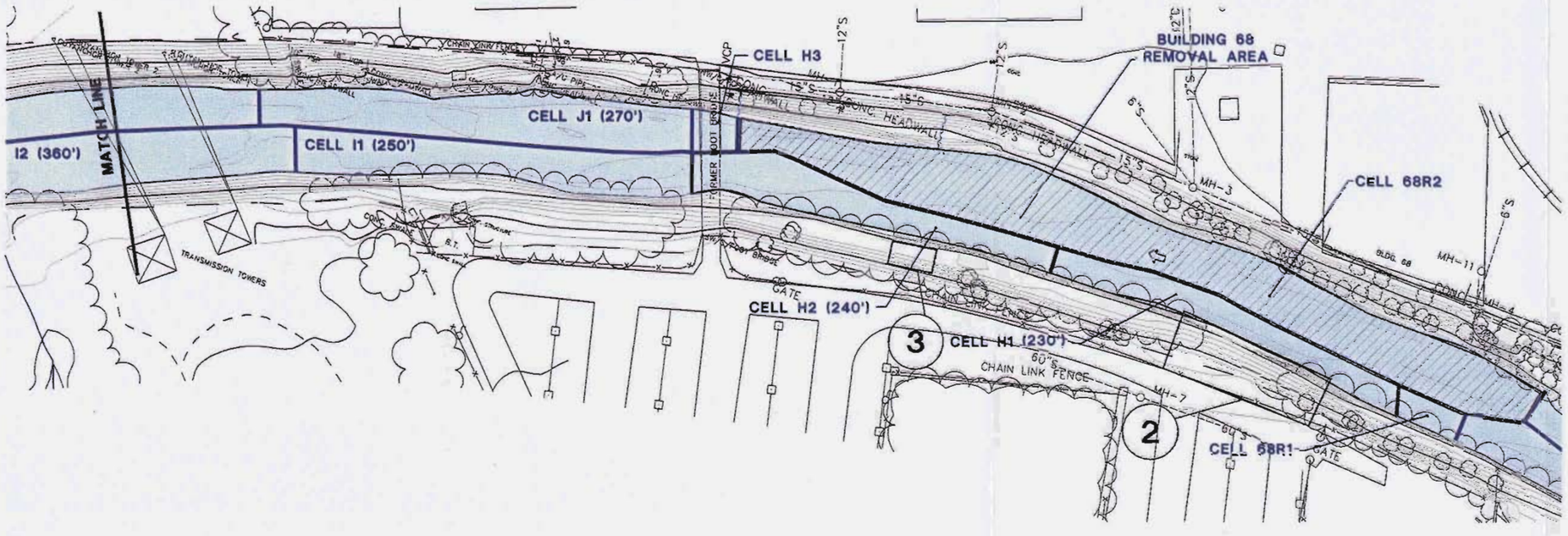
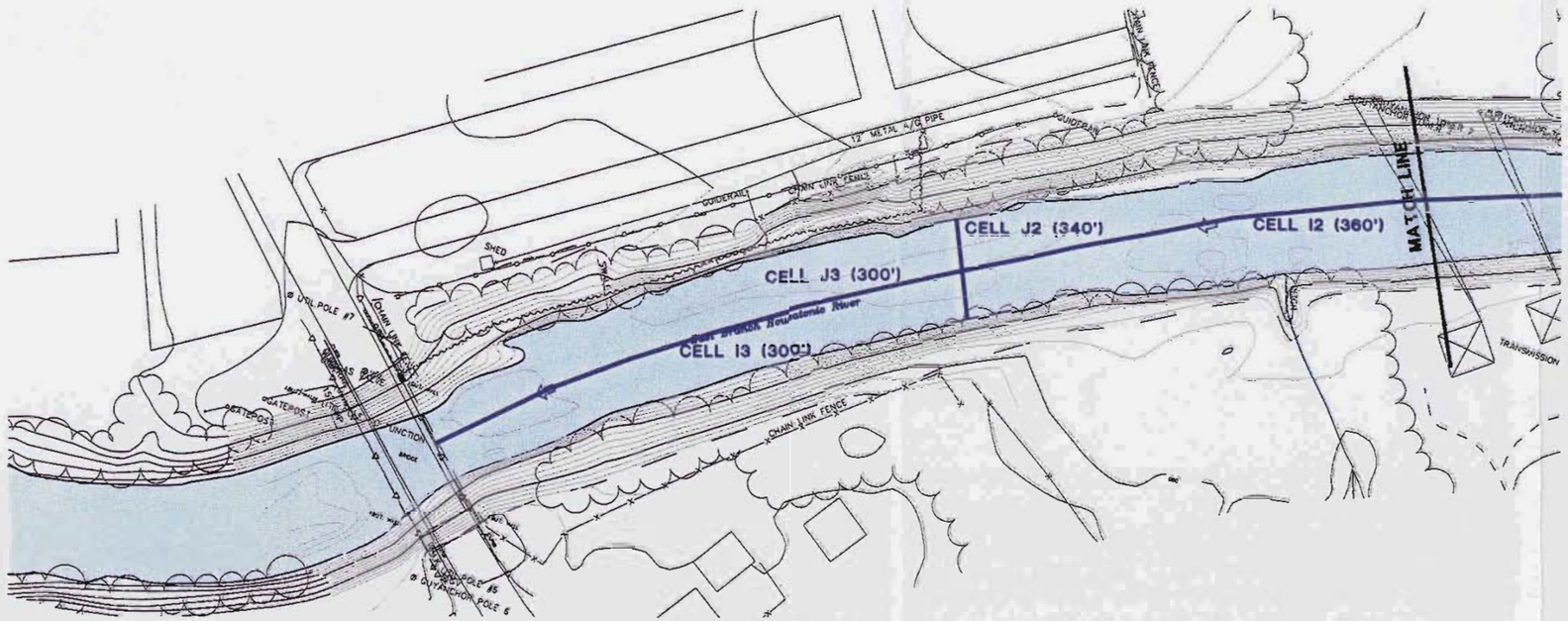
FIGURE 3-1

X: 20197X1A,20197X1B,20197X07,20197X22.DWG
LMAN: 9-15
P: D2BL
3/21/02 SYR-54-GWS PGL LJP RCB
GE_HOUSATONIC_UPPER_HALF_MILE\REPORTS & PRESENTATIONS\DRAFT 1\DWG\20197060\20197G12.DWG





LEGEND:

2 BANK INSPECTION AREA

EXISTING CONTAINMENT BARRIER LOCATION

TOP OF BANK

REMOVAL CELL

NOTES:

1. MAPPING IS BEST AVAILABLE INFORMATION AS OF 12/10/98 BASED ON MAPPING PROVIDED BY LOCKWOOD MAPPING, INC. PREPARED FROM 1990 AERIAL PHOTOGRAPHY; DATA PROVIDED BY GENERAL ELECTRIC; AND BLASLAND AND BOUCK, P.C. CONSTRUCTION PLANS. RIVERBANK AND RIVER BED TOPOGRAPHIC INFORMATION PROVIDED BBL FROM OCTOBER 12-23, 1998 FIELD SURVEY.
2. COORDINATE GRID BASED ON 1927 STATE PLAN COORDINATES.
3. ELEVATION DATUM REFERENCED TO NGVD 1929.
4. CELL LOCATIONS AND DISTANCES ARE APPROXIMATE.

0 40' 80'
GRAPHIC SCALE

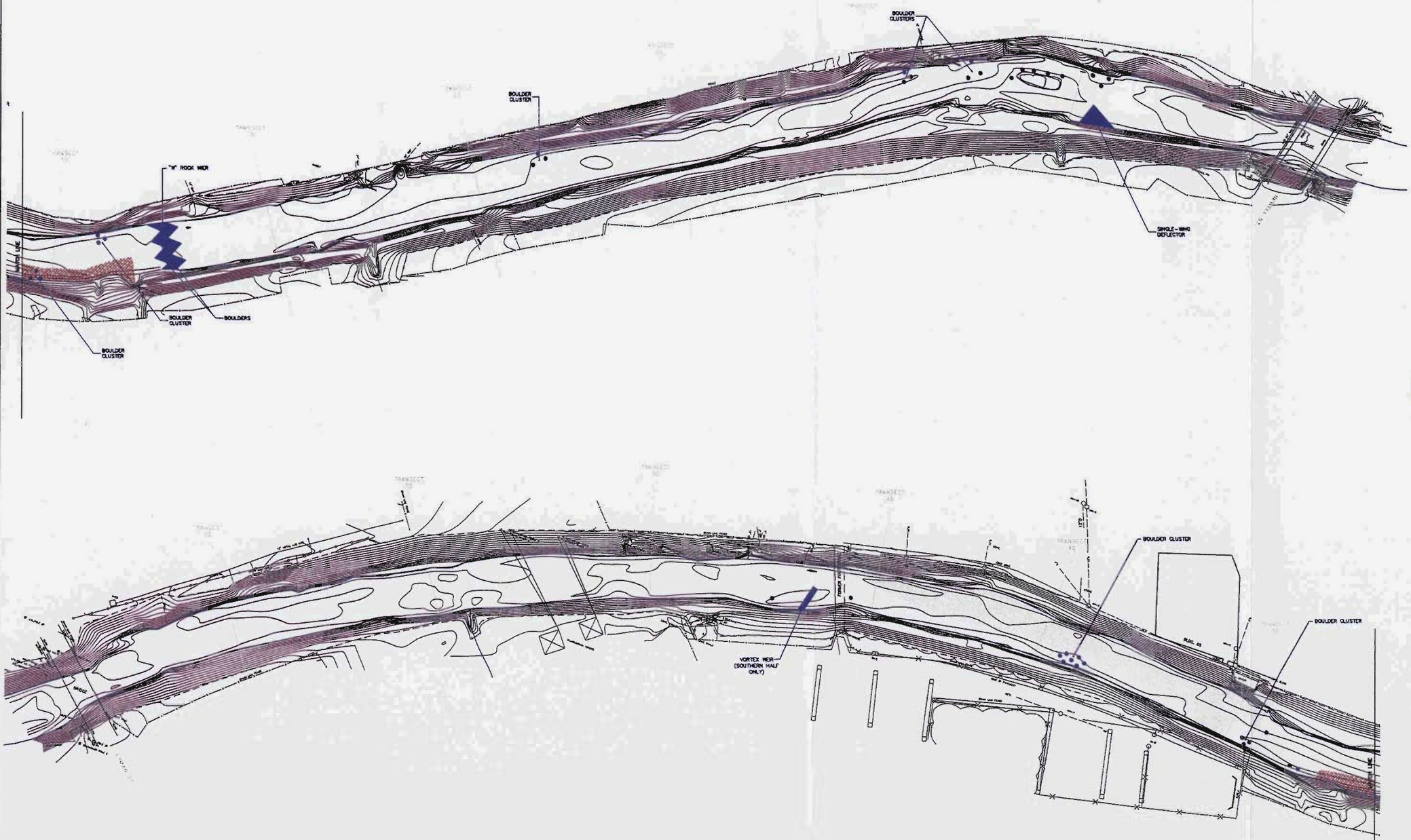
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
2001 ANNUAL MONITORING REPORT ADDENDUM
UPPER 1/2-MILE REACH OF HOUSATONIC RIVER

MAINTENANCE LOCATIONS FOR RESTORED BANK AREAS AND ARMOR LAYER (CELLS H-J)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 3-2

XI: 20197X1A,20197X1B,20197X07,20197X24.DWG
LMAN: 9-5
PI: PAGESET/PLT-DL2B
3/21/02 SYR-54-GWS (UP: RCB)
GE_HOUSATONIC_UPPER_HALF_MILE\REPORTS & PRESENTATIONS\DRAFT 1\DWG\20197060\20197013.DWG



LEGEND:

- CAP AND ARMOR AREAS (ARMOR STONE D100, 9")
- CAP AND ARMOR AREAS (ARMOR STONE D100, 12")
- AQUATIC ENHANCEMENT DEVICES
- HABITAT ENHANCEMENT BOULDERS
- BUILDING 68 REMOVAL AREA

NOTES:

1. ALL LOCATIONS AND DISTANCES ARE APPROXIMATE.
2. FIGURE DEPICTS GENERAL LOCATIONS OF MAJOR COMPONENTS OF THE HABITAT RESTORATION PLAN.
3. BOULDERS ARE PLACED ON TOP OF THE ARMOR LAYER AND ARE NOT KEYED INTO THE ARMOR LAYER.

0 80' 160'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
2001 ANNUAL MONITORING REPORT ADDENDUM
UPPER 1/2-MILE REACH OF HOUSATONIC RIVER

AQUATIC HABITAT ENHANCEMENT STRUCTURES

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4-1

Y: 20197505.DWG
LAYOUT: OFF-REF,ARROW, REST-CAP, REST-CAP-BHD, REST-OTHER,REST-OTHER-SHD*
PLOT: 1:1
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Attachment A

Spring 2001 Erosion Inspection Monitoring and Maintenance Report

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Corporate Environmental Programs
General Electric Company
100 Woodlawn Avenue, Pittsfield, MA 01201

May 21, 2001

Dean Tagliaferro
On-Scene Coordinator
U.S. Environmental Protection Agency
c/o Weston Environmental Engineering
One Lyman Street
Pittsfield, MA 01201

Re: GE Pittsfield/Housatonic River Site
Upper ½-Mile Reach Removal Action (GECD800)
Erosion Inspection Following High Flow Event (Spring 2001)

Dear Mr. Tagliaferro:

As you are aware, some areas of erosion have been observed within previously restored bank areas located in the upstream portion of the Upper ½-Mile Reach (from Newell Street Bridge downstream approximately 1800 feet) of the Housatonic River. Consistent with requirements set forth in the final *Removal Action Work Plan – Upper ½-Mile Reach of Housatonic River* (Work Plan) (Blasland, Bouck & Lee, Inc. [BBL], August 1999), GE has conducted an inspection of the banks in this stretch to assess both the cleared and restored areas for evidence of erosion. This inspection, which was performed on May 2, 2001, identified four areas with evidence of measurable erosion and five other impacted areas requiring further action due to settlement or exposed sheeting. These nine areas are shown on Exhibit A. In addition, in accordance with requirements of the Work Plan, GE has identified, to the extent practicable, the cause of erosion, has evaluated the source, dispersal, and quantity of eroded soil in the River, and where necessary and feasible, has developed proposed measures for removal of the eroded material from the river. Also provided below are GE's proposed measures to replace/restore the eroded areas to the previous restoration conditions and to reduce the potential for future erosion (if appropriate).

Areas with Measurable Erosion

During the May 2, 2001 bank inspection, a measurable loss of bank soil was noted at four areas, resulting from erosion caused by recent storm/high flow events. These areas are identified as Areas 1 through 4 on Exhibit A. A description of each area, along with the proposed action, is presented below and summarized in Table 1

Area 1 - Approximately 1.8 cubic yards (cy) of 1-inch stone eroded into the River from the area adjacent to the 64-X oil/water separator near Cell C/D (see Exhibit A). The source of eroded material was from the eastern drainage area outside the 64-X oil/water separator. The cause of erosion appears to be a stormwater catch basin (located in this area) that was covered and plugged with debris. To address eroded material in the River, GE proposes to remove the stone from the River and place the material back in the gravel drainage area outside the separator. In addition, to reduce future erosion in this area, the area around the stormwater catch basin and the drainage ditch leading to the catch basin will be cleared of debris, and the swale will be restored with 9 to 12-inch diameter rocks (rip-rap).

Area 2 - Approximately 2.5 cy of soil backfill eroded into the River near swale No. 15 on the south side of the River (see Exhibit A). The source of eroded soil appears to be from the restored bank area along the eastern fenceline at the top of swale No. 15. The erosion appears to have been caused by off-site stormwater accumulating at this point. No evidence of eroded soil was observed in the adjacent River and, therefore, no removal activities are planned at this location. To reduce possible future erosion in this area, rip-rap will be placed in the eroded area along the fenceline at the top of swale No. 15.

Area 3 - Approximately 59 cy of material (56 cy of soil backfill and 3 cy of material from below the previously excavated subgrade) eroded into the River from a restored bank area located at the upstream end of Cell G3 (see Exhibit A). The cause of erosion appears to be a combination of a major April flood event and the reduced cross-sectional area of river created by the sheetpiling used to isolate an adjacent cell (Cell F3). No evidence of eroded soil was observed in the adjacent River and, therefore, no removal activities are planned at this location. This area will be restored in accordance with the requirements of the Work Plan to previous conditions and grades; however, rip-rap will be placed over the 1:1 slope areas for additional stabilization. Once the river is returned to the original cross-section (i.e., the water diversion sheetpile is removed) and the additional rip-rap is placed, the potential for future erosion should be reduced.

Area 4 - The final area of observed erosion occurred near the downstream end of the restored bank in Cell G3 and extended into the Building 68 restored bank area (see Exhibit A). Approximately 28 cy of material (27 cy of soil backfill and 1 cy of material from below the previously excavated subgrade) eroded into the River from this area. In general, the apparent cause of erosion in this area is the same as presented above for Area 3 (April flood event and reduced river cross sectional area). The extent of erosion may have increased due to the temporary pipe bridge support in this area directing the floodwaters towards the bank. No evidence of eroded soil was observed in the adjacent River and, therefore, no removal activities are planned at this location. This area will be restored in accordance with the requirements of the Work Plan to previous conditions and grades. Once the river is returned to its normal cross-section and the temporary pipe bridge support is removed, the potential for future erosion should be reduced.

Other Impacted Areas

During the May 2, 2001 bank inspection, observations of the remaining restored bank areas indicated minimal evidence of erosion, and five areas were identified that required further action. These areas are identified as Areas A through E on Exhibit A. Primarily, these areas include locations where the source control sheetpiling was exposed and restored areas that had settled or where the seed and erosion mat had been displaced. Theses areas will be addressed by placing rip-rap and/or topsoil, seed, and erosion mats as required to restore the areas to final design conditions (see Table 1).

After completion of the above activities, GE will continue to conduct inspections of cleared and restored areas for evidence of erosion after each storm and high-water event (i.e., a flow of 440 cubic feet per second [cfs] or greater, as reported at the Coltsville gauging station) until herbaceous cover is established. If signs of erosion are observed following a high-flow event, GE will propose measures to address the areas and minimize future erosion.

Please contact me if you have any questions.

Sincerely,

Andrew T. Silfer/MCG

Andrew T. Silfer, P.E.
GE Project Coordinator

Attachments

cc: T. Angus, MDEP
R. Bell, DEP
J. Bieke, Shea & Gardner*
M. Carroll, GE
T. Conway, EPA*
J. Lyn Cutler, DEP (2 copies)*
Mayor Gerald Doyle, City of Pittsfield
C. Fredette, CDEP
R. Goff, USACE*
M. Gravelding, BBL*
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S. Messur, BBL*
K.C. Mitkevicius, USACE*
T. O'Brien, EOEA*
B. Olson, EPA*
S. Steenstrup, DEP*
D. Veilleux, Weston*
A. Weinberg, DEP
Public Information Repositories*

(* with attachments)

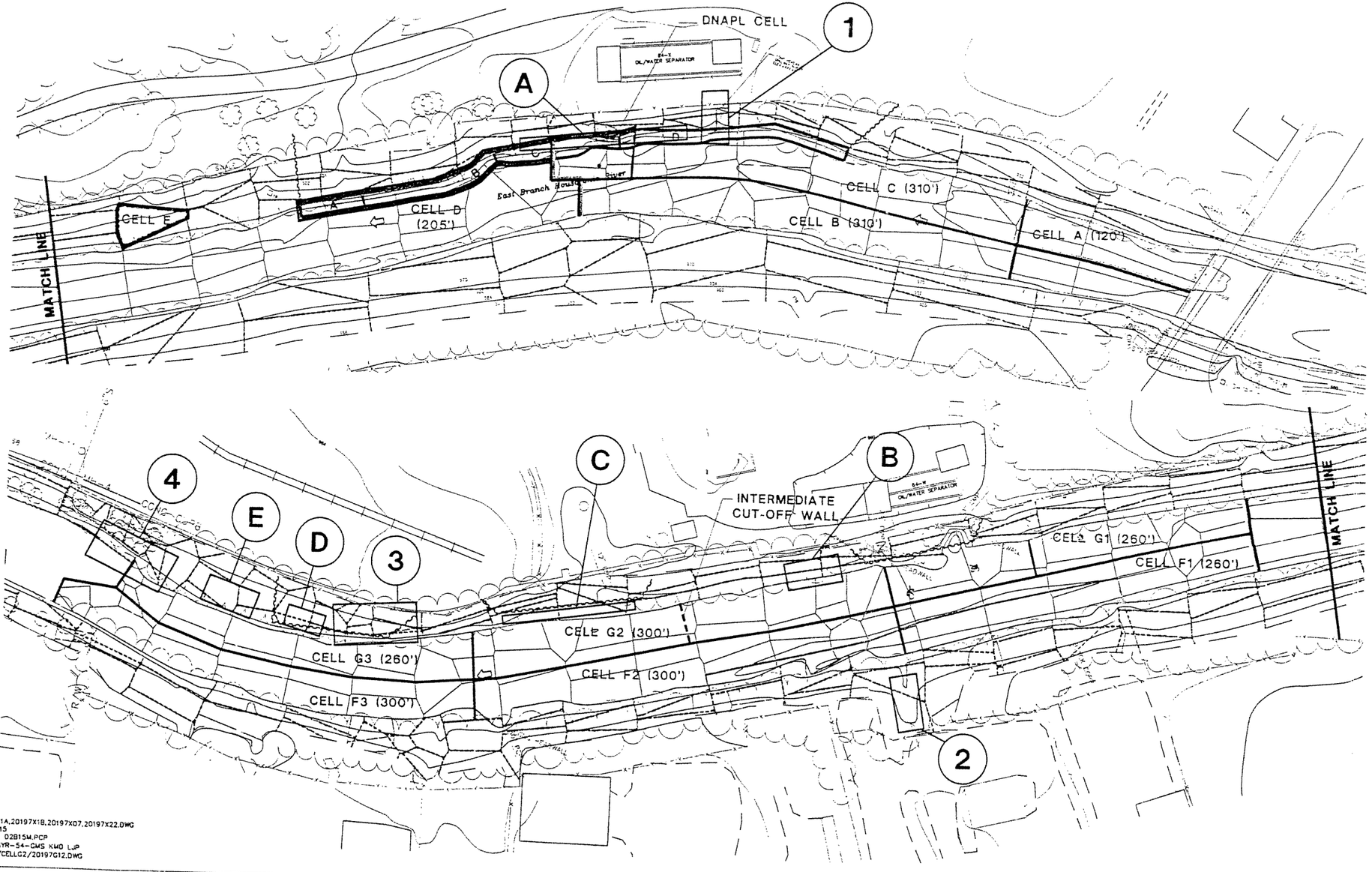
General Electric Company -Pittsfield Massachusetts
1/2-Mile Reach Removal Action

Table 1
Spring 2001 Bank Inspection Summary

Area	Description	Approximate Size	Action
Areas with Measurable Erosion			
1 - Cell C/D Outfall 6A	1" stone (from area around 64X oil/water separator) deposited on bank and in river. Stormwater catch basin near 64X O/W was covered and plugged with debris.	16' x 6' x 0.5' ~1.8 cy of 1" stone	Remove stone from river. Clear area around catch basin, clear swale area, and restore swale by placing rip-rap.
2 - Swale #15	Bank erosion along fenceline.	15' x 3' x 1.5' ~2.5 cy	Place rip-rap to fill void and stabilize area near fenceline.
3 - Cell G2/G3	Bank washout apparently due to April flood and reduced cross-sectional area of River due to construction.	70' x 10' ~ 59 cy	Restore to previous design grade and place rip-rap over 1:1 slope areas.
4 - Cell G3	Bank washout apparently due to April flood and reduced cross-sectional area of River due to construction.	60' x 12' ~ 28 cy	Restore to previous design grade.
Other Impacted Areas			
A - Cell C/D Waterloo wall	Exposed Waterloo sheeting at various locations along wall.	N/A	Reposition and place additional rip-rap at exposed sheet locations along entire length of wall.
B - Cell G2 - December flood washout area	Rip-rap settled in previous washout area.	40' x 5'	Place additional rip-rap.
C - Cell G2 Waterloo wall	Rip-rap and soil settled along mid-bank. Grass cover was not observed.	75' x 10'	Place additional rip-rap at exposed sheet locations along entire length of wall, place soil, re-seed, and place erosion mat in area above wall, as required.
D - Cell G3	Erosion mat and seed displaced at mid-bank.	75' x 6'	Place topsoil, re-seed, and place erosion mat over area.
E - Cell G3 Waterloo wall	Exposed Waterloo sheeting along wall.	N/A	Place additional rip-rap at exposed sheet locations along entire length of wall.

Key:
N/A = Not applicable
cy = cubic yard

Exhibit A - Upper 1/2 Mile Reach Removal Action
Sediment and Soil Removal Areas (Cells A-G)
Bank Inspection - Spring 2001



LEGEND:

- ① BANK INSPECTION AREA
- EXISTING CONTAINMENT BARRIER LOCATION
- 0'-1' BANK SOIL POLYGON
- 1'-3' BANK SOIL POLYGON
- TOP OF BANK
- BANK SOIL AREA BOUNDARY
- CAP AND ARMOR TIE-IN BUFFER
- REMOVAL CELL
- A B C ADDITIONAL EXCAVATION TO OCCUR IN CONJUNCTION WITH SOURCE CONTROL ACTIVITIES

NOTES:

1. MAPPING IS BEST AVAILABLE INFORMATION AS OF 12/10/98 BASED ON MAPPING PROVIDED BY LOCKWOOD MAPPING, INC. PREPARED FROM 1990 AERIAL PHOTOGRAPHY; DATA PROVIDED BY GENERAL ELECTRIC; AND BLASLAND AND BOUCK, P.C. CONSTRUCTION PLANS, RIVERBANK AND RIVER BED TOPOGRAPHIC INFORMATION PROVIDED BBL FROM OCTOBER 12-23, 1998 FIELD SURVEY.
2. COORDINATE GRID BASED ON 1927 STATE PLAN COORDINATES.
3. ELEVATION DATUM REFERENCED TO NGVD 1929.
4. ALL LOCATIONS AND DISTANCES ARE APPROXIMATE.

0 40' 80'
GRAPHIC SCALE

X: 20197X1A,20197X1B,20197X07,20197X22.DWG
LMAN: 9-15
P: 15M-0, 02B15M.PCP
5/18/01 SYR-54-GMS KMO LJP
20197030/CELLG2/20197G12.DWG

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