



01 - 0359

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

Transmitted Via Federal Express

March 9, 2001

Bryan Olson
EPA Project Coordinator
U.S. Environmental Protection Agency
EPA New England
One Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

**Re: GE-Pittsfield/Housatonic River Site
On-Plant Consolidation Areas (GEC210 and GEC220)
EPA Conditions for Approval of OPCA Work Plan**

Dear Mr. Olson:

The General Electric Company (GE) has reviewed the United States Environmental Protection Agency's (EPA's) letter dated January 30, 2001, providing conditional approval for GE's June 1999 *Detailed Work Plan for the On-Plant Consolidation Areas* (Detailed Work Plan), as amended by GE's August 12, 1999 Addendum and modified by GE's June 13, 2000 Response to EPA's April 27, 2000 Comments (collectively, the OPCA Work Plan). That letter establishes four conditions for EPA's approval of the OPCA Work Plan and also sets forth three additional recommendations regarding the OPCAs.

At the outset, GE was surprised that EPA's January 30, 2001 letter established a number of new conditions for its approval of the OPCA Work Plan. GE had previously understood, based on discussions with EPA, that once GE addressed the issue regarding the performance of a geophysical survey and other investigations to assess the potential presence of dense non-aqueous-phase liquid (DNAPL) in the area near the Hill 78 OPCA (which GE addressed in a letter of September 8, 2000), all of EPA's comments on the OPCA Work Plan would be addressed and EPA would be in a position to approve the OPCA Work Plan without imposing new conditions. Nevertheless, in this letter, GE addresses each of the conditions set out in EPA's January 30 letter and describes how GE plans to comply with those conditions. In addition, this letter responds to the additional recommendations in EPA's letter. Each of EPA's comments is repeated below followed by GE's response.

EPA CONDITIONS

EPA Condition 1:

GE shall provide to EPA interim filling and grading plans to identify how the OPCA will be filled in stages over the next several construction seasons. Since GE has indicated that they intend to build out and fill the OPCA horizontally before going vertical, these plans, coupled with the engineering properties (i.e., shear strength, consolidation behavior, moisture content) determined for the waste material, can be used to periodically review the stability and overall structural integrity of the OPCA's developmental stages over time. These interim plans will also assist field personnel in the

Bryan Olson
March 9, 2001
Page 2

execution of the work and ensure that issues such as access and storm water management can be effectively addressed as GE fills the OPCA.

On numerous occasions in either the Detailed Work Plan or in separate communications with EPA, GE has indicated to EPA that the design and construction of the OPCAs will be performed in an incremental or phased manner. Under such approach, GE prepares interim construction plans and filling/grading plans in consideration of the ongoing/projected Removal Actions. In general, GE will submit such interim plans to EPA, and has in fact done so for the past construction activities that have already been performed at the OPCAs. Specifically, GE transmitted a letter to EPA dated June 2, 2000 containing pertinent sections of the May 2000 *Request for Proposal (RFP) for On-Plant Consolidation Activities and Stormwater Drainage Improvements*. That RFP contained interim filling and grading plans, as well as technical specifications that were used by the remediation contractor in completing the work activities at the OPCAs in 2000. Also, GE transmitted a letter to EPA on March 23, 2000 providing the technical drawings and specifications related to the proposed modifications to the leachate collection system at the Building 71 OPCA which were completed in May 2000.

Consistent with this approach, GE will continue to provide future OPCA plans to EPA. To the extent that such plans relate to the design and construction of additional components of the OPCAs (e.g., the construction of additional horizontal cells) and are not already covered by the existing OPCA Work Plan, such plans will be provided to EPA for approval. However, the submittal of interim grading/filling plans to EPA is considered to be for informational purposes only and not specifically subject to EPA approval. The Performance Standards for the OPCAs, set out in Section 2.1.4.2 of the *Statement of Work for Removal Actions Outside the River*, require GE to operate the OPCAs in accordance with the operations plan and requirements in the OPCA Work Plan, as approved or conditionally approved by EPA. They do not require specific EPA approval for each set of interim grading/filling plans. Such interim grading/filling activities will be designed and implemented by GE consistent with the overall approved OPCA Work Plan. GE will not proceed with interim grading/filling activities that are inconsistent with or will jeopardize final closure activities.

EPA Condition 2:

GE shall comply with standard engineering and construction practices associated with earthwork activities. Specifically,

- a. GE shall use appropriate material for structural fill in the construction of above-grade embankments (berms). This material shall be placed in a controlled manner, e.g., thin lifts of not more than 12 inches in loose thickness and compacted to a defined density.*
- b. GE shall define in their construction quality control plan (CQC) a process for determining that the appropriate in-place moisture content and density, and verification of lift thickness, have been attained to verify that compaction criteria are being met in accordance with GE's OPCA design specifications. This comment will be repeated in EPA's comments on the CQC.*

As GE reads the above conditions, they apply to the construction of additional above-grade embankments (berms) at the OPCAs. As such, GE provides the following responses.

Bryan Olson
March 9, 2001
Page 3

With respect to Condition 2.a, we note that, as indicated in Attachment 1 to GE's letter to EPA dated June 2, 2000 (*RFP for On-Plant Consolidation Activities and Stormwater Drainage Improvements*, May 2000), the maximum thickness of uncompacted fill layers for above-grade embankments was 12 inches, with a minimum compaction requirement of 90 percent (refer to Materials and Performance Section 02200 - Earthwork). GE will require the same (or more stringent as necessary) standards for structural fills in the construction of future above-grade embankments.

With respect to Condition 2.b, EPA's comment seems to imply that GE should address these issues in its overall *Construction Quality Assurance Plan* (CQAP), which was submitted to EPA in January 2001 as part of the Project Operations Plan for the Removal Actions Outside the River. However, since this comment relates specifically to the OPCAs, GE believes that it should be addressed in the context of the OPCA submittals, not the general site-wide CQAP.

GE has developed methods for determining the in-place moisture content, density, and lift thickness of the above-grade embankments. The methods are described generally in the June 1999 OPCA *Construction Quality Assurance Plan* (BBL, 1999) included as Attachment C to the Detailed Work Plan. As discussed in that attachment, more specific information related to determining the appropriate in-place moisture content and density and verification of lift thickness is provided in the technical specifications for each OPCA construction activity. For the work activities at the OPCAs in 2000, this information was contained in the May 2000 *RFP for On-Plant Consolidation Activities and Stormwater Drainage Improvements* (specifically, Materials and Performance Section 02200 - Earthwork), submitted to EPA on June 2, 2000. GE will require the same (or more stringent as necessary) performance standards in the construction of future above-grade embankments. These requirements and standards will be provided to EPA prior to performance of the construction activities.

EPA Condition 3:

GE shall provide written guidance as to the acceptance criteria for miscellaneous debris. This guidance shall address the potential for the presence of large cobbles, broken concrete, organic debris such as roots and branches, and general debris such as tires and other metal objects. According to standard practices, the maximum allowable size of material is correlated to placement of the material. For example, debris should be no larger than could be the size of the lift. Debris may be larger than the lift, however, if sufficient distance, both horizontally and vertically, is maintained from the liner and cover system to enable compaction of soil on all sides. GE shall not stack, nest, or carthouse large debris due to the potential for future collapse of the material.

GE has developed and will continue to review the acceptance criteria for miscellaneous debris and its appropriate placement in the OPCAs. For the year 2000 consolidation activities, this information was contained in the May 2000 *RFP for On-Plant Consolidation Activities and Stormwater Drainage Improvements* (specifically in the technical drawings and specifications), which was submitted to EPA on June 2, 2000. Similarly, for future consolidation activities, this information will be incorporated into the design for the OPCAs (i.e., in the RFP). Again, GE will provide the relevant sections of this document to EPA prior to performance of the work activities.

Bryan Olson
March 9, 2001
Page 4

EPA Condition 4:

GE shall complete the geophysical survey of the Hill 78 Consolidation Area. GE shall complete the geophysical survey, data analysis and any necessary subsurface investigations, to meet the requirements of the July 6, 1999 conditional approval letter and this conditional approval letter, [prior] to any expansion of the current boundaries of Hill 78.

GE will perform the geophysical survey of the Hill 78 OPCA and any other necessary subsurface investigations in that area as described in GE's September 8, 2000 letter to you, as well as in prior submittals to EPA. In accordance with prior agreements, GE will not place any materials in portions of the Hill 78 OPCA subject to this survey and investigations until the survey and investigations are completed.

Additional EPA Comment

After listing the above conditions, EPA's letter states that: "*GE shall comply with the above-conditions prior to material placement in the OPCAs for the 2001 season.*" Based on discussions with EPA, it is our understanding that EPA did not intend that statement to require GE to complete the geophysical survey and subsurface investigations in the Hill 78 OPCA area, referred to in EPA Condition 4, prior to material placement in the OPCAs for the 2001 season. Rather, as noted above, GE will complete that survey and associated investigations prior to placement of any materials in the portion of the Hill 78 OPCA subject to the survey and investigations.

GE's above responses describe how GE plans to comply with the conditions stated in EPA's letter. If anything in these responses is not acceptable to EPA, we would appreciate it if EPA would so advise us promptly.

EPA RECOMMENDATIONS

In addition to the above conditions, EPA's letter provides a number of other recommendations regarding the OPCAs. EPA's introductory paragraph for those recommendations and each recommendation are quoted below, followed by GE's response.

EPA believes that proper design and construction of the OPCAs requires that GE investigate the moisture content and shear strength of the material placed in the OPCA during the year 2000 and that GE establish acceptance criteria for optimum moisture content for material to be placed in the OPCAs in the year 2001 and beyond. EPA believes that these steps, especially identifying and complying with moisture content criteria, are necessary for the continued stability of the OPCAs and for GE to meet the OPCA performance standards. Accordingly, EPA recommends GE address the following issues:

EPA Recommendation I:

Based upon field observations of the material placed in the OPCA (e.g., high moisture content) and the fact that additional material placement is not planned to occur until the Spring of 2001, EPA suggests that GE investigate both the moisture content and shear strength of the material placed in 2000. EPA understands that GE believes that adequate drainage of the material placed in 2000 is

Bryan Olson
March 9, 2001
Page 5

occurring (based on the volume of water being collected by the under drain system) and that understanding moisture content is not necessary. However, without knowing the acceptable design moisture content and the residual moisture content of the material, knowing the quantity of water which passes through the placed material is not conclusive in evaluating the adequacy of the material's stability. The relationship of moisture content and shear strength will govern the overall slope stability of the OPCA. Therefore, GE should review the existing conditions to quantitatively determine if the OPCA cell will remain stable.

From our discussions with EPA last year regarding the materials that were consolidated within the Building 71 OPCA, GE learned of EPA's concerns about the observed high moisture content of the materials present within that OPCA. It should be clarified, however, that the wet nature of the materials was due to several significant rain events that occurred during the initial consolidation activities. Further, based on conversations subsequent to an EPA site visit and inspection of the materials after they had been allowed to drain and dry and were mechanically compacted, we understand that EPA was satisfied with GE's efforts concerning the consolidation of materials at the OPCA. Also note that the material placed in the Building 71 OPCA in 2000 was a representative mixture of the materials that will be consolidated in the OPCA in future years. Materials consisted of soils from the Allendale School Removal Action, soils and sediments from the Upper 1/2 Mile Reach Removal Action, building debris (i.e., steel, concrete, wood, etc.) generated during Building 71 demolition, and miscellaneous construction debris (e.g., tires, plastic sheeting, etc.).

GE concurs with EPA that "knowing the quantity of water which passes through the placed material is not conclusive in evaluating the adequacy of the material's stability." However, while the moisture content of a given material is an important parameter, it does not -- as EPA implies -- dictate the overall stability of the OPCA. Instead, the final in-situ shear strength (i.e., friction angle) of the material has a greater influence on the stability of the materials in the OPCA.

Based on the above considerations, GE does not believe that any quantitative moisture content testing of the materials placed in the OPCAs in 2000 is necessary. With respect to future consolidation activities, GE may at its option perform moisture content and/or density testing of in-place materials to determine consistency with the overall OPCA design parameters. This issue is discussed further in response to EPA Recommendation II below.

EPA Recommendation II:

Based on the fact that moisture content has a significant influence on the behavior of material, EPA strongly recommends that GE establish a material acceptance criterion tied to the optimum moisture content rather than to the paint filter test. The range for optimum moisture content can be determined via either a standard or modified Proctor test. For example, a silty material may have an acceptable range of optimum moisture content, a clayey material have another range, and a sandy material yet another range.

To clarify GE's procedure, the paint filter test is conducted prior to the transport of material from its point of origin (i.e., the area within which the response actions are being undertaken) to confirm that the material does not contain free liquids and can be transported to the OPCAs. It is not used to determine material acceptance. Rather, the most critical aspect of the consolidation activities is the final in-situ condition of the materials prior to the placement of additional materials or interim or final covers (as appropriate). For example, although the materials placed in the OPCAs in 2000 were delivered to the

Bryan Olson
March 9, 2001
Page 6

OPCAs in a relatively unsaturated condition, heavy precipitation during and after active consolidation within the OPCAs significantly altered the materials' moisture content, thereby requiring extensive soil conditioning (i.e., drying and recompacting). For these reasons, GE questions the efficacy of moisture content testing of materials prior to delivery to the OPCAs. Rather, GE believes that it is more appropriate to continue applying its in-situ performance requirements (e.g., maximum lift thickness, bearing capacity, number of passes with compaction equipment, etc.). As noted above, however, GE may, in the future perform testing to determine an optimum moisture content and maximum density for the materials to be placed in the OPCAs. The results of the testing would then be used to determine any soil conditioning methods that may be necessary prior to and/or during consolidation activities to ensure that acceptable in-situ final conditions are achieved.

In this connection, EPA's letter later states that if GE provides its moisture content requirements for the OPCAs, EPA will comply with them for the materials to be excavated from the 1½ Mile Reach of the river. Consistent with the Consent Decree, GE will require that EPA comply with the paint filter test requirement for such materials. If GE develops any other recommendations for EPA with respect to the moisture content of the materials from the 1½ Mile Reach, GE will provide those recommendations to EPA.

EPA Recommendation III:

Typically, EPA's review of landfill designs/consolidation areas include the evaluation of various geotechnical parameters in order to demonstrate that key earthwork, constructability, foundation, slope stability, and lining/cover system performance criteria are satisfied. The review usually includes soil stratigraphy and supplemental information obtained from geotechnical field and laboratory investigations. For the foundation soils, waste material, and proposed borrow soils, the following types of analysis are typically performed during landfill design:

- a. *Analysis of bearing capacity of foundation soils under the proposed facility for the anticipated loadings.*
- b. *Settlement analysis of the waste material (and foundation soils) under the anticipated loadings and the impact of said settlements on the grading and stability of the facility's cover and bottom lining systems.*
- c. *Stability analysis of any critical below-grade excavation slopes and above-grade perimeter berms/embankments for containment.*
- d. *Stability analysis of both the critical interim waste side-slopes and the developing facility, as well as critical above-grade side-slopes for the completely filled and closed facility, including an analysis of the veneer stability of the final cover system.*
- e. *An evaluation of the effects of seismic activity on the proposed slope configurations of the facility.*

GE trusts that EPA considered each of these items in its prior review and approval of the OPCA construction plans. The above geotechnical design analyses and evaluations were considered by GE during the design of the OPCAs, and can be forwarded to EPA upon its request. In addition, with the approach established for constructing the OPCAs (i.e., in several phases over numerous years), as critical slopes or other geotechnical conditions develop, they can be addressed at that time, and changes made as

Bryan Olson
March 9, 2001
Page 7

necessary. As this information is modified or altered based on actual site information obtained during OPCA construction activities, it too can be forwarded to EPA at its request.

Please let me know if you have any questions about the above responses or would like to discuss them further. As noted above, we would appreciate it if EPA would let us know promptly if EPA has any issues with the way in which GE plans to meet the conditions in EPA's January 30 letter.

Sincerely,


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

U:\MSGC01\1691199.doc

cc: M. Nalipinski, EPA
T. Conway, EPA
H. Inglis, EPA
K.C. Mitkevicius, USACE
D. Veilleux, Weston
A. Weinberg, MDEP
R. Bell, MDEP
S. Steenstrup, MDEP (2 copies)
S. Keydel, MDEP
N. Harper MA AG
D. Young, MA EOE
Mayor Gerald Doyle, City of Pittsfield
Pittsfield Commissioner of Public Health
J. Bernstein, Bernstein, Cushner & Kimmel
A. Thomas, GE
M. Carroll, GE
R. McLaren, GE
A. Silfer, GE
J. Novotny, GE
J. Bieke, Shea & Gardner
J. Nuss, BBL
W. Rankin, BBL
Public Information Repositories
GE Internal Repositories