



CITY OF CAMBRIDGE
CAMBRIDGE, MASSACHUSETTS 02139

TEL 349-4300
FAX 349-4307

EXECUTIVE DEPARTMENT
ROBERT W. HEALY
City Manager

RICHARD C. ROSSI
Deputy City Manager

May 1, 1996

To The Honorable, The City Council:

As you are aware, a number of fact finding efforts have been underway over the last several months regarding a proposal for development of the W. R. Grace site for retail and hotel use. Efforts undertaken by the City to review current and future environmental conditions include: engaging the services of an independent environmental consultant, to advise us all of any potential health risks related to contamination from previous industrial activity at the site; ongoing review of Grace Site remediation and construction activities associated with both the MBTA facilities and Russell Field; working with the Massachusetts Department of Environmental Protection as they review the site classification and remediation under the Massachusetts Contingency Plan; and review of wetlands and floodplain concerns at the site. With respect to traffic issues, the City engaged the services of a traffic consultant, Rizzo Associates, Inc. to review the traffic impacts associated with the proposed use. All of this information has been recently discussed during the numerous meetings of the Grace Site Advisory Committee which was convened to identify and review issues, concerns and opportunities associated with the proposed retail/hotel development.

While the proposal for the supermarket, retail and hotel use has recently been withdrawn from consideration, the information gathered through these efforts remains useful. Enclosed you will please find the initial and final reports prepared by Dr. John D. Spengler, of Environmental Health & Engineering, Inc. and the Harvard School of Public Health, on public health issues associated with site contamination.

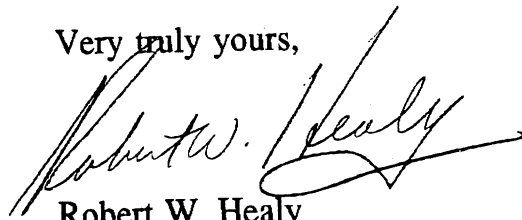
Dr. Spengler's report concludes that the contamination on site as a result of industrial activities does not present a risk to public health and recommends additional measures to further ensure this. His conclusions address the site under existing conditions, during construction (assuming implementation of a management plan as required by the Massachusetts Department of Environmental Protection) or during proposed,

redeveloped conditions. To further ensure protection against future risk; his report recommends the following actions to the developer and the City:

- monitor groundwater at site perimeter to detect potential migration of site contaminants.
- review and approval of soil remediation activities by Massachusetts Department of Environmental Protection.
- clarify whether contaminated soil from the W.R. Grace site was stored on Russell Field, and if any contamination remains.

The City Staff have already begun to work with the MBTA regarding use of Russell Field and the Massachusetts Department of Environmental Protection regarding Massachusetts Contingency Plan review of the W.R. Grace site. I will keep you informed of progress in implementation of these recommendations.

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert W. Healy", written in a cursive style with a large, sweeping flourish at the end.

Robert W. Healy
City Manager

COMMUNITY DEVELOPMENT
1996 SEP 23 AM 3:57
CITY OF CAMBRIDGE

Haley & Aldrich, Inc.
58 Charies Street
Cambridge, MA 02141-2147
Tel: 617.494.1606
Fax: 617.577.8142
Email: BOS@HaleyAldrich.com



27 September 1996
File No. 10063-065

Department of Environmental Protection
10 Commerce Way
Woburn, Massachusetts 01801

Attention: Mr. Edward Weagle
Subject: Request for Interim Deadline Extension
W.R. Grace & Co. Property
Cambridge, Massachusetts
RTN 3-0277

Gentlemen:

In accordance with our conversation today, we have requested and you have agreed to an extension to 11 October 1996 of the interim deadline of 27 September 1996 in your Notice of Audit Findings dated 20 September 1996. This extension is requested, and you have granted it, in recognition of the fact that the Audit finding was delayed in being released by the Department and the fact that W.R. Grace & Co. concurs with the Audit Finding that the Tier Classification for the site is to be revised to a Tier IC. This will require public notices and the preparation of a Tier I Permit Application which will require additional time to be completed.

Thank you for your understanding.

Sincerely yours,
HALEY & ALDRICH, INC.


Wesley E. Stimpson
Senior Vice President

PA100631065\DEPLTR.WPF

c: W.R. Grace & Co.; Attn: Mr. David Wightman
Cambridge Board of Health; Attn: Mr. Michael Nicoloro
Cambridge City Hall; Attn: Mr. Robert Healy
Cambridge Community Development Dept.; Attn: Ms. Elizabeth Epstein & Mr. Stuart Dash
Cambridge Conservation Commission; Attn: Mr. Alex Strysky
Cambridge Fire Dept.; Attn: Deputy Chief James Harrington
Cambridge Main Library; Attn: Reference Library, W.R. Grace Disposal Site
North Cambridge Library; Attn: Reference Library, W.R. Grace Disposal Site
Honorable Charles Flaherty, Speaker of the House
Honorable Robert Havern, Massachusetts Senate
Ms. Alma Balonon-Rosen, Key Petitioner
Ms. Karen Coker, Key Petitioner
Mr. Joseph Joseph

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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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Governor

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Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

By **CERTIFIED MAIL**
RETURN RECEIPT REQUESTED

SEP 20 1996

W.R. Grace & Co. - Conn.
62 Whittemore Avenue
Cambridge, MA 02140-1692

Attn: Mr. David Wightman

RE: **CAMBRIDGE -**
W.R. Grace
62 Whittemore Avenue
RTN 3-0277
NON-NE-96-3P008

NOTICE OF AUDIT FINDINGS
NOTICE OF NONCOMPLIANCE
INTERIM DEADLINE LETTER

This is an important notice.
Promptly respond to any requests contained herein.
Failure to respond to any such requests could result in
serious legal consequences.

Dear Mr. Wightman:

The Massachusetts Department of Environmental Protection has completed an audit of the location described above (the site). The audit focused primarily on the Tier II Classification Submittal prepared by your Licensed Site Professional, Mr. Wesley Stimpson of Haley & Aldrich, Inc.. Other activities reviewed during this audit are listed in the attached Audit Memorandum. This Notice informs you of the results of the Department's audit.

VIOLATIONS EXIST THAT REQUIRE FURTHER ACTION

The audited response actions do not comply with the requirements of the Massachusetts Contingency Plan. Department personnel have found that additional actions must be taken to correct violations and deficiencies in the Tier Classification Submittal provided for the disposal site.

The activities which are in noncompliance and the actions the Department wants you to take to come into compliance are described in the enclosed Noncompliance Summary. The Noncompliance Summary describes: (1) each activity identified during the Audit which is in noncompliance, (2) the requirements violated, (3) the action the Department now wants W.R. Grace & Co. - Conn. (hereafter referred to as "you/your") to take, and (4) the deadline for taking such action. An administrative penalty may be assessed for every day from now on that you are in noncompliance.

DEADLINE FOR RETURNING TO COMPLIANCE

You are advised to complete the measures the Department has specified within the timeframes outlined in the Noncompliance Summary, to avoid additional enforcement actions by the Department.

DEFICIENCIES EXIST THAT REQUIRE FURTHER ACTION

A. Deficiencies that Require Further Action. The Department has identified the deficiencies listed below. Steps which should be taken to correct each deficiency are also listed.

Deficiency: In subsection VI. of the NRS, ten points were subtracted from Subsection V.A. Environmental Resources Areas. However, there is no Technical Justification for this 10 point deduction, as detailed in the Department's Audit Memorandum.

Steps to be taken to correct deficiency: Revisions to the NRS scoresheet and Transmittal Form BWSC 107A should be provided to correct this deficiency. Such revisions should be provided by September 27, 1996.

Deficiency: The Department's NOR to W.R. Grace included the following requirement: "The possibility of contaminated groundwater from the site entering basements of off-[property] residential buildings must be evaluated. If such a condition can not be ruled out, mitigating measures must be considered. If it can be ruled out, the data and analysis on which that conclusion is based must be thoroughly documented. ..." The Department does not have the "... data and analysis ..." which demonstrates that contaminated groundwater has not/will not impact residential basements in the Harvey Street/Clifton Street neighborhood.

Steps to be taken to correct deficiency: The Department requests that W.R. Grace provide the necessary information which demonstrates that contaminated groundwater has not/will not impact the residences in the Harvey Street/Clifton Street neighborhood.

B. Deficiencies that do not Require Action. No further steps are necessary to correct this deficiency since it was corrected prior to/during the course of the Audit.

Deficiency: In responding to the comments raised during the public comment period, W.R. Grace misinterpreted section 40.1405 (5)(c) of the MCP and limited their Response Summary to just the comments specifically on the draft Plan. W.R. Grace did in fact answer all other comments received in separate letters to the commentors. Because the Response Summary should have included all comments raised, W.R. Grace addressed this deficiency by amending Appendix G of the Plan to include all comments and responses.

You do not need further Department approval to take the actions described herein. To respond to the Department's request, please complete the additional measures the Department has specified, and then submit the appropriate documentation of your actions for each deficiency. The Department advises you to revise the Tier Classification Submittal in order to correct the identified deficiencies and resubmit by September 27, 1996. This deadline constitutes an **Interim Deadline** pursuant to 310 CMR 40.0167.

CONCLUSION

DO NOT IGNORE THIS NOTICE. Failure to correct the violations and deficiencies identified and provide documentation of such action to the Department may subject you, your officers, and other involved individuals to enforcement action by the Department. The Department may conduct a follow-up audit to determine whether the required actions have been taken. If the Department finds that the violations and deficiencies have not been corrected, then the Department may issue a Notice of Noncompliance (NON), Notice of Intent to Assess a Civil Administrative Penalty (PAN), administrative enforcement order, Notice of Responsibility (NOR), Notice of Intent to take Response Action (NORA), Administrative Consent Order, Unilateral Order, or seek a Judicial Judgement as appropriate. You may also be subject to cost recovery under 310 CMR 40.1200 for failure to perform response actions at the disposal site.

LICENSED SITE PROFESSIONAL

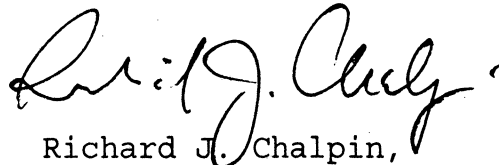
A copy of this Notice has been sent to Mr. Wesley Stimpson, the Licensed Site Professional (LSP) of record for your disposal site. You may consult with the LSP of record when preparing a response to this Notice. Note, however, that you, not your LSP, are obligated to respond to this Notice and remedy the deficiencies. Note that any submittals to the Department made in response to this Notice must include the certification provided in Attachment B signed by an authorized individual as specified in 310 CMR 40.0009.

LIMITATIONS

The Department relies upon the accuracy of the information reviewed during the Audit to make these findings. These findings do not: (1) apply to actions or other aspects of the site that were not reviewed in the Audit, (2) preclude future audits of past, current, or future actions at the site, (3) in any way constitute a release from any liability, obligation, action or penalty under M.G.L. c. 21E, 310 CMR 40.0000, or any other law, regulation, or requirement, or (4) limit the Department's authority to take or arrange, or to require any Responsible Party or Potentially Responsible Party to perform, any response action authorized by M.G.L. c. 21E which the Department deems necessary to protect health, safety, public welfare or the environment.

If you have any questions regarding this Notice or any requirements contained in it please contact Edward J. Weagle at the letterhead address or by calling (617) 932-7719. Please reference the Release Tracking Number in any correspondence regarding the site.

Very truly yours,



Richard J. Chalpin,
Regional Engineer for the
Bureau of Waste Site Cleanup

SB

Attachments: (A) Site Memorandum (24 pages)
(B) Certification of Submittals (1 page)
(C) Noncompliance Summary (2 pages)

W.R. Grace & Co. - Conn.
Notice of Audit Findings
Page 5

cc: (w/ attachment C)

Cambridge Board of Health, 831 Massachusetts Avenue,
Cambridge, MA 02139, Attn: Mr. Michael Nicoloro
Cambridge City Hall, City Manager's Office, 795 Massachusetts
Avenue, Cambridge, MA 02139, Attn: Mr. Robert Healy

cc: (w/ attachments A & C)

Cambridge Board of Health, 831 Massachusetts Avenue,
Cambridge, MA 02139, Attn: Mr. Michael Nicoloro
Cambridge City Hall, City Manager's Office, 795 Massachusetts
Avenue, Cambridge, MA 02139, Attn: Mr. Robert Healy
Cambridge Community Development Department,
57 Inman Street, Cambridge, MA 02139,
Attn: Elizabeth Epstein & Stuart D. Dash
Cambridge Conservation Commission, 57 Inman Street, Cambridge,
MA 02140, Attn: Alex Strysky
Cambridge Fire Department Headquarters, 491 Broadway,
Cambridge, MA 02183, Attn: Deputy Chief James Harrington
Cambridge Main Library, 449 Broadway, Cambridge, MA 02138,
Attn: Reference Librarian, W.R. Grace Disposal Site
North Cambridge Library, 60 Rindge Avenue, Cambridge, MA
02138, Attn: Reference Librarian, W.R. Grace Disposal Site
Honorable Charles Flaherty, Speaker of the House,
Massachusetts House of Representatives,
State House, Boston, MA 02133
Honorable Robert Havern, Massachusetts Senate, State House,
Boston, MA 02133
Alma Balonon-Rosen, Key Petitioner, 51 Madison Avenue,
Cambridge, MA 02140
Karen Coker, Key Petitioner, 24 Magoun Street,
Cambridge, MA 02140
Joseph Joseph, Key Petitioner, 18 Dudley Street,
Cambridge, MA 02140
Haley & Aldrich, Inc., 58 Charles Street, Cambridge, MA 02141
Attn: Mr. Wesley E. Stimpson, LSP-of-Record
Steve Winslow, BWSC DEP BOSTON
John Fitzgerald, BWSC DEP NERO

cc: (w/out attachments)

DEP/BWSC/NERO/Data Entry/Files
Karen Stromberg, DEP NERO

DEP File Copy



COMMONWEALTH OF MASSACHUSETTS
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Secretary

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Lt. Governor

DAVID B. STRUHS
Commissioner

Attachment A

AUDIT MEMORANDUM

TO: File

THROUGH: John J. Fitzgerald, Deputy Regional Engineer,
Bureau of Waste Site Cleanup

FROM: Edward J. Weagle, Environmental Geologist

DATE: July 25, 1996

SUBJECT: CAMBRIDGE, RTN 3-0277
W.R. Grace Co, 62 Whittemore Avenue

AUDIT OF TIER II CLASSIFICATION SUBMITTAL

I. ACTIONS AUDITED

The Audit included a review of the following:

- The Tier II Classification Submittal, prepared by Mr. Wesley Stimpson, LSP-of-Record. This review also considered the reported presence of a non-potable water supply well on Whittemore Avenue;
- A review of the potential for contaminated groundwater from the site to impact basements of residential properties located on Whittemore Avenue, Harvey Street, and Clifton Street;
- The potential for contamination to be present at the surface of Russell Field; and
- A review of public participation activities relative to compliance with pertinent DEP regulations and policies.

II. AUDIT ACTIVITIES

The Audit consisted of the following activities:

- A Notice of Audit dated January 26, 1996.
- An informal request for supporting documents. In a February 1996 telephone conversation, the Department requested Haley & Aldrich to supply all of the documents regarding the site which were missing from the Department's files. Additional documents were received on March 15, 1996.
- A site inspection on May 3, 1996 which included visual observation of site conditions, and screening of selected wells, for the presence of volatile organic compounds, with a photoionization detector.
- A review of supplemental information from the LSP received on June 11, 1996, providing additional justification in an effort to support the score assigned to subsection II.D. of the NRS.

During the course of this audit, the Department has received a number of comments/concerns from local residents regarding activities at the site, the most significant of which were transmitted to the Department under a cover letter from Mr. Craig Kelly, Esq., dated February 12, 1996. Although a thorough response to all the comments received is beyond the scope of this audit, the Department has reviewed and considered all comments received, and has addressed these comments in this memorandum where appropriate.

III. SITE SUMMARY

The W.R. Grace Company-Conn. (W.R. Grace), in conjunction with Mr. Wesley Stimpson (LSP-of-Record) of Haley & Aldrich, Inc. (H&A) have submitted a Tier II Classification for the above-referenced property (the site). Included with the submittal were a Tier Classification Submittal Transmittal Form and a Numerical Ranking System (NRS) Scoresheet. Extensive supporting documentation previously compiled over the years has been provided to DEP.

According to the 1993 Transition List of Confirmed Disposal sites and Locations To Be Investigated, the site is listed as a Confirmed, Non-priority Disposal Site without a Waiver. The Transition requirements for Confirmed, Non-priority disposal sites without Waivers are set forth at 310 CMR 40.0636. The Transition Provisions indicate that a Tier Classification is necessary because a Response Action Outcome was not provided by the Transition Deadline of August 2, 1995.

SITE HISTORY

According to information present in the Department's file, portions of the site were developed in the 1800's by companies associated with clay mining. Clay was mined from Jerry's pit (now Jerry's Pond) from 1860 to the 1880's. In 1919, the Dewey and Almy Chemical Company established a rubber products (including sealing compounds and gaskets) manufacturing facility at the site. W.R. Grace acquired the site in approximately 1950 and continued the Dewey & Almy manufacturing processes.

Portions of the site are currently utilized as office buildings (One Alewife Center) and for research and development. The remainder of the site is used as paved parking or is currently unpaved and undeveloped. Bricks were reportedly made on-site from the mined clay. Prior to 1860, the site used to be wetlands; a majority of which were filled and/or otherwise altered.

Abutters to the site include: to the north across Whittemore Avenue, residential properties and paved parking areas; to the east, Russell Field Park with residential properties beyond it; to the south across Jerry's Pond and Rindge Avenue, residential high-rise apartments; to the west across Alewife Brook Parkway, an MBTA train station, a parking garage, and commercial properties; and to the northwest, one residence, and additional residences on the far side of Alewife Brook Parkway and Alewife Brook.

The releases reported under RTN 3-0277 are a result of historical releases associated with the operations of the chemical companies and disposal of manufacturing wastes at the site.

In 1980, a groundwater investigation identified groundwater contamination in the vicinity of the site where industrial process wastes had been landfilled. Subsequent studies performed for the MBTA concluded that these process wastes would have to be removed before the Red Line Extension project could continue.

In order for the construction of the MBTA's Red Line extension (which traverses the site) to proceed, all of the industrial process wastes at the site were first treated by mixing the material to create a stable clay-like slurry mixture. Then the slurry was allowed to dry at the site before being removed. After the material was sufficiently dry, it was placed into trucks by the MBTA, reportedly for transport from the site to a landfill in Kingston, Massachusetts.

According to Mr. Edward Pawlowski of the Department's Bureau of Waste Prevention, several hundred truckloads of the stabilized industrial wastes were taken to the Kingston, Massachusetts landfill beginning on November 2, 1981, and ending on April 3,

1982, with no movement occurring between December 3, 1981 and March 30, 1982. The treated material was used to grade the Kingston landfill in preparation for the final capping process. According to the Perini Corporation, which was awarded with the stabilized waste removal contract from the MBTA, a total of 17,620 cubic yards of solidified sludge were transported from the site.

An issue which has been raised by the surrounding community is the fact that the hazardous waste manifests documenting the transportation of the treated material have not been available for review. According to Mr. Pawlowski, based on Federal and State regulations that were in effect in 1981, the untreated material was likely classified under those regulations as an industrial waste, not as a hazardous waste. Non-hazardous wastes are not required to be transported under hazardous waste manifests, and as such, it is unlikely that the stabilized industrial wastes were transported under hazardous waste manifests. Therefore, hazardous waste manifests documenting the movement of the stabilized industrial wastes probably do not even exist. If other transportation manifests exist, the MBTA, as the generator and the transporter of the treated material, should have copies of these transportation records.

After the stabilized wastes had been removed by the MBTA, excavation into the underlying contaminated soils for tunnel construction had begun. Both cut/cover and tunnel boring were performed. Excavated soil was segregated into three categories: (1) heavily contaminated soil to be removed and disposed of off-site; (2) marginally contaminated soil to be reused on site; and (3) uncontaminated soil to be handled properly (including removal from the site). However, it has been reported that some marginally contaminated soil was removed from the site and used at various locations along the Red Line alignment, including at the Davis Square station. The soil was staged at Russell field, along with construction materials and equipment. After the Alewife extension had been completed, Russell Field was restored by the MBTA.

On February 9, 1987, the Department issued W.R. Grace a Notice of Responsibility (NOR). The NOR identified a number of items that the Department required W.R. Grace to complete, including:

- * A Risk Assessment addressing all potentially affected receptors;
- * An evaluation of the possibility that contaminated groundwater from the site may enter into basements of residential buildings;
- * A Feasibility Study and Remedial Action Plan for soil and groundwater contamination; and

- * A hazardous materials management plan to monitor and control additional releases of oil/hazardous materials to be implemented during remediation and/or site redevelopment activities.

The Phase II Comprehensive Site Assessment including a Risk Assessment were approved by the Department in correspondence to W.R. Grace dated March 2, 1990. A "Feasibility Study" dated May 1988 was prepared to identify and evaluate possible remedial response actions that could be implemented at the site. This report was meant to satisfy the requirement of the NOR, and is roughly analogous to a 1993 MCP Phase III - Identification, Evaluation, and Selection of Comprehensive Remedial Action Alternatives, as defined by 310 CMR 40.0850. Because the Department has not approved of this report in writing, the site is considered to be in Phase III of the 1993 MCP. It is the writer's recommendation that W.R. Grace review this report in the context of the requirements set forth in 310 CMR 40.0850. After such review, a Phase III Completion Statement pursuant to 310 CMR 40.0862 should be filed if the May 1988 report meets the requirement set forth at 310 CMR 40.0850. After the Phase III completion statement (and any additional supporting documentation, if necessary) is provided, W.R. Grace may be able to show that they have met the regulatory requirements to file a Class C Response Action Outcome statement for the disposal site.

SITE INSPECTION

On Friday, May 3, 1996, at 11:00 am, the writer met with: Mr. Wesley Stimpson of Haley & Aldrich, Mr. David Wightman and Mr. Rod McClaren of W.R. Grace Co.; and Ms. Liz Epstein and Ms. Kathleen Brown of the City of Cambridge Community Development Department. The meeting took place at the properties located at and in the vicinity of 62 Whittemore Avenue in Cambridge, hereafter referred to as "the site". It was a humid, cloudy morning with light intermittent rain showers, and temperatures in the upper 60s.

The following notes and comments are based primarily on the Department's observations during this Site Inspection, and may also include information present in the Department's files. This Site Inspection was conducted for the purpose of documenting site conditions as part of the audit.

During the site inspection, four (4) groundwater monitoring wells were screened for the presence of volatile organic compounds (VOCs) within the well casing headspace, using an OVM Model 580A photoionization detector. Results are as follows:

<u>well ID</u>		<u>Comments</u>
703	ND	Metal standpipe damaged, PVC riser intact, readings above background not detected
707	0.4	background at 0.1 to 0.2
503	0.2	background at 0.1 to 0.2
207	0.2	background at 0.1 to 0.2

The inspection began at the lobby of the 62 Whittemore Avenue administration building. The group walked west on the sidewalk along Whittemore Avenue down to the corner of Whittemore Avenue and Alewife Brook Parkway. Along the way, the writer took note of the roadbox for well 902. The writer looked carefully for wells 8 and 602A, however, these wells appeared to have been destroyed or buried.

Paved parking lots and residences are present along the north side of Whittemore Avenue. A residence is also present at the corner of Whittemore Ave and Alewife Brook Parkway, abutting the site. A grassy landscaped area approximately 30 feet wide separates One Alewife Center (located along the south side of Whittemore Ave.) and this residence.

The area south of the One Alewife Center building consists of landscaping along the edge of the building, with a large paved parking area just beyond it. A six-foot chain link fence separates the parking lot from the unpaved/undeveloped portions of the site. The fence had been knocked down at two locations. Mr. Wightman indicated that extensive snow removal activities this winter had damaged the fence in these two locations. At this point, Ms. Epstein departed, and the remainder of the group stepped over the downed fence for a closer observation of the unpaved portions of the site, south of the paved parking areas.

The fence that borders between the unpaved portions of the site and the surrounding properties (i.e., the Rt. 16 right-of-way, the MBTA property on the east side of Rt. 16, the walking path easement, and Russell field) is eight feet high and of chain link construction. The writer closely inspected this perimeter fence, which borders the surrounding properties, and noted that the fence was in excellent condition. Breaks or breaches were not observed. Based on the writer's observations, it appears that this portion of the fence is serving it's design purpose: to prevent people from accessing the site from Russell Field, the walkway easement, and the MBTA property.

During the perimeter fence inspection, the interior of the undeveloped portions of the site were closely viewed. Some of these areas contained standing water up to approximately 6 inches deep. The standing water did not exhibit any overt signs of

contamination, such as odors, sheens or stressed/absent vegetation, although most of the vegetation present were dried stalks left over from the previous growing season. Extensive areas of very wet, spongy ground were also encountered.

Also, observed in the area were four (4) elongated piles of soil, approximately 150 feet long, which were arranged to form a square. These piles were about 3 to 4 feet higher than the surrounding area, and contained concrete rubble, apparently from former structures that had previously been demolished. According to Mr. Wightman and Mr. Stimpson, these piles are what remains from a bioremediation pilot project that had been conducted in the late 80's. This project is not currently active.

The portions of the site that abut Russell Field were observed next. As indicated above, the fence was in excellent condition. Beyond the fence, Russell field appeared to be well-maintained. The writer observed that the grade of Russell Field at it's north-west corner appeared approximately 4 or 5 feet higher in elevation than the adjacent land surface. According to Mr. Wightman, Russell Field was regraded by the MBTA in the mid 1980's, after the completion of construction activities associated with the extension of the Red Line.

While walking back toward the facility, the writer inquired of Mr. Wightman as to what operations does W.R. Grace currently conduct at the facility. Mr. Wightman stated that research and development of new concrete mixtures is currently performed at the facility, and he pointed out blocks of concrete in a fenced enclosure that were subjects of W.R. Grace's work. This work reportedly includes development of new concrete formulations as well as testing of these new formulations for strength and durability.

The writer also inquired as to what were the current redevelopment plans were for the site. Mr. Wightman stated that a Notice of Project Change, which would have reduced the size and altered the scope of the original redevelopment proposal, had recently been withdrawn from the MEPA review process. Mr. Wightman further indicated that the original proposal, which had already been approved by EOEPA, would likely go forward in the future. The writer stated that appropriate site redevelopment was consistent with the Department's Brownfields program, which encourages the redevelopment of urban sites where extensive infrastructure is already in place, as opposed to developing previously undeveloped land and open spaces located away from urban infrastructure. In addition, the writer stated that remediating the remaining contamination while redeveloping the property was probably the most cost-effective way of completing the cleanup for the site.

After the tour, a discussion among Mr. Stimpson, Mr. Wightman, Mr. McClaren, and the writer ensued. Issues addressed during this discussion included the timing and possible content of the Department's Notice of Audit Findings letter. The inspection of the W.R. Grace property concluded at approximately 12:40 pm.

At 1:00 pm, the writer met Mr. John Hudson of the MBTA at the entrance to the MBTA Alewife station train platform. The writer and Mr. Hudson then proceeded down onto the platform, where the writer screened the ambient air at locations along the platform as well as the four tunnel entrances, two of which lead down under the W.R. Grace property. The writer noted that the approach or departure of a train induced an air current into or out of the tunnels. All readings recorded by the writer were at background (0.0-0.1 ppmv). Elevated readings were not detected, and the writer did not note the presence of any odors. At approximately 1:10, the writer concluded the screening and departed.

NRS SCORESHEET REVIEW

The following documents the writer's review of the information contained in the Department's files for the purpose of evaluating the Tier Classification Submittal (the submittal) of the above-referenced disposal site in accordance with the 310 CMR 40.1500. Other comments by the writer are expressed where appropriate. In addition, the writer has reviewed the NRS comments presented by Environmental Health & Engineering, Inc. (EH&E) in an April 23, 1996 final draft report entitled "Public Health Risk Evaluation for W.R. Grace Site in Cambridge, Massachusetts", prepared for the Cambridge Community Development Department. Included is an evaluation of these comments, where appropriate. Although not directly related to the response actions audited, this report concludes that "Based on available data there is no reason to consider the W.R. Grace site, as it currently exists, to be a health concern to the neighboring community, which includes residents and recreational users of the Russell Field Facilities."

TOTAL SCORES:

SECTIONS	SUBMITTAL SCORE	AUDIT SCORE
II. EXPOSURE PATHWAYS	105	120
III. DISP. SITE CHARACTERISTICS	122	126
IV. HUMAN POP. AND LAND USES	25	40
V. ECOLOGICAL POPULATION	100	100
VI. MITIGATING CONDITIONS	<u>20</u>	<u>25</u>
TOTAL	332	361

The submittal states that neither of the Tier I inclusionary criteria are applicable for this release.

SECTION II. EXPOSURE PATHWAYS:

SECTIONS	SUBMITTAL SCORE	AUDIT SCORE
A. SOIL	15	15
B. GROUNDWATER	20	20
C. SURFACE WATER	20	20
D. AIR	0	15
E. SOURCES	<u>50</u>	<u>50</u>
TOTAL	105	120

The writer agrees with the scores assigned to Subsections II.A, II.B, II.C, and II.E.

Relative to Subsection II.A., Soil Exposure Pathway, the submittal indicates that oil and/or hazardous material (OHM) is either located beneath paved surfaces or at depths greater than 6 inches below grade. Based on the results of a 1995 soil boring program conducted in an effort to further delineate the extent of the Total Petroleum Hydrocarbon (TPH) contamination, the writer has taken note that soil samples from the top 6 inches of the site were not collected for analysis. Samples collected from 1 to 3 feet below grade were found to contain TPH concentrations up to 9,120 mg/kg, well in excess of the RCS-1 concentration for TPH (500 mg/kg). Given that such high concentrations of TPH were detected just below the 0 to 6 inch horizon, the presence of contaminants within the 0 to 6 inch horizon, such as TPH concentrations exceeding 500 mg/kg, can not be dismissed without actually collecting and analyzing samples from this horizon. However, although TPH contamination in excess of 500 mg/kg may exist within the top 6 inches of soil at the site, that by itself does not represent a Potential Exposure Pathway, due to the fact that access to this area is restricted by fencing, and the contaminated areas are not used for active recreation.

Relative to Subsection II.B., Groundwater Exposure Pathway, the private well located in the vicinity of the site is NOT a drinking water well, and therefore additional points implying a potential exposure pathway would not be appropriate.

Relative to Subsection II.C., Surface Water Exposure Pathway (surface water includes wetlands), the writer concludes that 20 points is correct for this subsection, for the following reasons: (1) contaminated groundwater from the site eventually discharges to Alewife Brook and detectable concentrations of OHM likely attributable to the disposal site have been identified in Alewife

Brook during past sampling rounds; (2) a release (past or on-going) of OHM to surface water (Jerry's Pond) has been identified; and (3) wetlands located on the property adjacent to Russell Field are in the same area where the groundwater contamination is most elevated. Therefore, OHM has been identified in groundwater at concentrations that are likely to result in detectable concentrations in surface water (the on-site wetlands). Finally, the surface water quality in these wetlands (when standing water is present) has not been determined. If future sampling of the surface water in these wetlands identifies concentrations of OHM in excess of Ambient Water Quality Criteria, then it would be necessary to revise the score assigned to this subsection.

The writer disagrees with the assignment of 0 points to Subsection II.D., Air Exposure Pathway. In this subsection, the LSP states: "OHM attributable to the disposal site has not been identified in, and is not anticipated to be identified in air." This statement is identical to the citation given at 310 CMR 40.1512 (4) and as such, does not provide any Technical Justification as to why this selection is appropriate. The lack of Technical Justification supporting this statement, and the absence of references to the Phase I and/or other applicable reports where the rationale for this statement is presented, is deficient relative to the requirements of 310 CMR 40.1505 (1) and 310 CMR 40.1505 (3).

310 CMR 40.1505 (2)(d) states "310 CMR 40.1512 (4) shall be applied to establish the score for Air Exposures for Subsection II.D." 310 CMR 40.1512 (4) for **None or Not Applicable**, states that a score of 0 points shall be assigned if "OHM likely attributable to the disposal site has not been identified in, and is not anticipated to be identified in, air." This designation is clearly not appropriate, as OHM likely attributable to the disposal site has been identified in air, and is anticipated to be identified in air, as detailed below.

Section 1.1 of the Meta Systems Inc. May 16, 1988 Health Risk Assessment states: "Almost any movement of soil containing naphthalene on the site will cause sufficient emission of naphthalene to produce an odor which will be detectable in local neighborhoods when they are downwind." This statement is in direct contradiction to the rationale presented in this subsection ("OHM ... is not likely to be identified in air.") Given that site remediation and redevelopment may involve the disturbance of naphthalene-contaminated soils, detectable concentrations of odors may be liberated to ambient air. Furthermore, the proposed remedial/redevelopment scenario will expose soil contaminated with naphthalene, which will subsequently volatilize and be released to ambient air. Due to the low odor threshold of naphthalene, it is reasonable to conclude, as it has been by W.R. Grace's Risk

Assessment consultant, that detectable concentrations of naphthalene will be released into the air upon site remediation/development.

In an effort to determine the appropriate score that should be assigned to Subsection II.D., the writer has evaluated the **Evidence of Contamination and Potential Exposure Pathway** definitions set forth at 310 CMR 40.1512 (4). **Evidence of Contamination** is considered to be any of the following:

- (1) "A release, or potential release, of OHM to air has been identified." or
- (2) "OHM that may be released to air as particulate material has been identified in the top 6 inches of the ground surface. Unbroken pavement/concrete slab surfaces may be interpreted as preventing release of particulates to air." or
- (3) "OHM that may be released to air as a vapor has been identified in an open container or surface impoundment that is part of the disposal site." or
- (4) "An odor that is reasonably attributable to a release of OHM at the disposal site has been identified."

A Potential Exposure Pathway is considered to be any of the following:

- (1) "OHM releases, likely attributable to the disposal site, have been repeatedly identified in ambient air within 100' of a residence, school, hospital, nursing home, or playground when such releases are above ambient background concentrations and are not related to permitted releases." or
- (2) "Total volatile organic compounds have been identified in groundwater at concentrations greater than or equal to 5 mg/l within 30 feet of a school or occupied residence where the depth to groundwater is less than or equal to 15 feet. ..." or
- (3) "A reasonable likelihood exists that the indoor air quality of an occupied building will be impacted by OHM likely attributable to the disposal site."

First, under **Evidence of Contamination**, the writer rules out (3) because open containers or surface impoundments do not currently exist, and retains (1), (2) and (4) because these appear to be applicable. Second, under **Potential Exposure Pathway**, the writer rules out (2) because this condition has not been identified, and retains (1) and (3) because these appear to be, at a minimum, possible. In order to narrow down these choices even further, it is necessary to consider all documented occurrences of detectable odors likely attributable to the disposal site.

Potentially due to the fact that most of the Department's site file is missing, there is only one documented occurrence of odors emanating from the site in the file. At 2:07 on May 22, 1989, a resident living adjacent to Russell Field called Ms. Nancy Bettinger, the Department's former site manager for this location, to report that strong odors were emanating from the site.

As a result of the absence of written documentation in the file, the writer had several recent discussions with Nancy

Bettinger regarding the issue of odors from the site. During those conversations, Ms. Bettinger indicated that she could recall receiving numerous complaints from local residents of odors emanating from the site, and on one occasion when Ms. Bettinger was conducting a site inspection, she personally noted naphthalene odors adjacent to the Russell Field Ballpark. In addition, the writer consulted with the Department's Division of Air Quality (DAQ) in an effort to determine if there had been any recorded complaints of odors from the site. DAQ indicated that at 2:30 pm on June 25, 1990, the Department received a complaint of naphthalene odors emanating from the site. Based upon the nature and extent of the residual contamination, extensive past agency observations and involvement, and neighborhood/municipal records and observations, odors are clearly a concern at this site.

On June 11, 1996, Haley & Aldrich supplied additional information to support the None or Not Applicable designation. This included a two page narrative and copies of two reports, dated February 1988 and February 1, 1989 and prepared by TRC Environmental Consultants, which documented the performance of air monitoring activities at the site. Samples were collected during each of the four seasons, and samples were analyzed by NIOSH method 1501. The TRC reports conclude that naphthalene was detected above reporting limits in only 2 out of 26 ambient air samples collected during four seasonal sampling events. However, these reports also state that at low concentrations, naphthalene is not easily desorbed from the charcoal collection tube, and "...that during sampling days, TRC staff observed a mothball odor at the remediation site. This is the indication of the presence of naphthalene." In addition, the fact that a naphthalene odor was observed by TRC during sampling and was detected at concentrations above method detection limits in two of the samples further demonstrates the inappropriateness of the statement "OHM attributable to the disposal site has not been identified in ... air."

Finally, on page two of the narrative, H&A states: "We believe it is not the purpose of the NRS to consider future odors in assigning points for the air pathway." and "The NRS addresses only current issues." These statements are not consistent with 310 CMR 40.1512 (4) for **None or Not Applicable**: "OHM likely attributable to the disposal site has not been identified in, and is not anticipated to be identified in, air." This regulatory citing clearly intends for the entire site history (save risk reduction measures previously completed) to be used. The Department interprets "... has not been ..." to include documented past site conditions, and "... is not anticipated to be ..." to include potential future site conditions. Based on these statements, it is clearly not appropriate to narrowly define the temporal relationship of site conditions to the moment that the Tier Classification is developed. Although risk reduction measures were

completed at the site in the early 1980's (the MBTA's removal of the manufacturing waste sludge), all of the potential sources for naphthalene odors, i.e., the naphthalene-contaminated soil, have not been remediated.

It is important to note that while the occurrences of naphthalene odors detectable by local residents are not believed to pose an increased risk of harm to human health via the inhalation exposure pathway, the occurrence of these vapors is a nuisance issue, and as such, this exposure pathway should be scored appropriately.

Therefore, in light of the above, the writer recommends a score of 15 points for this subsection.

SECTION III. DISPOSAL SITE CHARACTERISTICS:

SECTIONS	SUBMITTAL SCORE	AUDIT SCORE
A. OHM TOXICITY	40	40
B. MULTIPLE OHMS	30	30
C. OHM MOBILITY AND PERSISTENCE	40	40
D. DISPOSAL SITE HYDROGEOLOGY	<u>12</u>	<u>16</u>
TOTAL	122	126

The writer agrees with the scores assigned to Subsection III.A., III.B., and III.C.

Relative to Subsection III.A., after the writer's review of all OHMs present at the site pursuant to 310 CMR 40.1506(1)(a), the writer concludes that the correct score has been assigned to this subsection.

The writer does not agree with the score assigned to Subsection III.D., Disposal Site Hydrogeology. In this subsection, a score of 12 points was assigned, indicating that site soils have a "medium" permeability and that the highest identified depth to groundwater was between 5.1 and 10.0 feet below grade. However, concentrations of TPH greater than both RCS-1 and RCS-2 have been detected in soil samples collected from locations in the vicinity of well B-212, and concentrations of naphthalene greater than the RCGW-2 standard of 6,000 $\mu\text{g}/\text{l}$ have historically been detected in wells B-212, B-707, and B-708, with concentrations as high as 45,000 $\mu\text{g}/\text{l}$ having been previously recorded (at B-212). According to well gauging data collected by Haley and Aldrich in December 1994, the water table in these wells was measured to be between 6.08 and 7.40 feet below the top of the well casing. These three wells all have approximately 3.5 feet of metal well casing which extends above the ground surface. Therefore, after subtracting approximately 3.5 feet from the depth to groundwater measurements

made from the top of the well casing, the writer concludes that the water table in the vicinity of these three wells was approximately 2.5 to 4.0 feet below the ground surface at the time of the depth to groundwater measurements. In accordance with 310 CMR 40.1506 (1)(e) 1., the writer recommends assigning a score of 16 points to this subsection to indicate that the highest identified seasonal groundwater level is less than 5.1 feet below grade. This recommendation is further supported by the writer's observations during the site inspection that surface water is present in wetlands in the vicinity of these three wells for at least a portion of the year.

SECTION IV. HUMAN POPULATION AND LAND USES:

SECTIONS	SUBMITTAL SCORE	AUDIT SCORE
A. HUMAN POPULATION	25	25
B. AQUIFERS	0	0
C. WATER USE	<u>0</u>	<u>15</u>
TOTAL	25	40

The writer agrees with the scores assigned to Subsections IV.A. and IV.B.

The writer does not agree with the score assigned to Subsection IV.C., Water Use, due to the fact that there is a private well located at 12 Whittemore Avenue. This well was installed for the purpose of providing an alternative source of water (than the MWRA) for the irrigation of plants at Mr. Edward Norberg's greenhouse business. According to a February 15, 1996 telephone conversation between the writer and Mr. Norberg, this well does not have a pump or associated piping for extracting water, and neither a pump (yield) test nor a water quality test have been conducted on this well. According to Mr. Norberg, the well is not currently used and has never been used, reportedly, due to the expense that would be involved in pumping the water from the 960 foot deep bedrock well. However, Mr. Norberg stated to the writer that he desires to retain the ability to use this well in the future, if rising MWRA water costs or water restrictions make it economically beneficial or necessary.

The writer has reviewed the available information, and based on Haley & Aldrich figure 3C dated November 1995, the writer concludes that the following exploration locations are within 500 feet of the Norberg well: TP-223, B-201, B-202, and B-901.

Evaluation of Soil Quality Information- A soil sample collected from test pit 223 (TP-223) was composited with three other soil samples (from TP-206, TP-207, & TP-222) then analyzed for a range of parameters. This composite sample was found to

contain concentrations of ABNs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b,k)fluoranthene, and chrysene each of which exceeds the RCS-1 standard of 0.7 mg/kg. In addition, 6 other ABNs were reported as being present but no concentrations were given. Therefore, it is not possible to determine if any of these 6 reported ABNs exceed the respective RCS-1 concentrations. Because the analyzed sample was collected from four separate locations, three of which were collected farther than 500 feet of the Norberg Well, and because discrete follow-up sampling was not conducted/reported, is not possible to conclusively determine if the exceedance of RCs were due to soil conditions at this location. In the absence of conclusive soil analytical data, and in accordance with the requirements of the Response Action Performance Standard, the writer concludes that the exceedances of RCs are, at least in part, due to soil contaminant conditions at the location of TP-223. Therefore, contaminated soil does exist within 500 feet of the Norberg well.

Evaluation of Groundwater Quality Information- The three monitoring wells that are located within 500 feet of the Norberg well are B-201, B-202, and B-901. Based on a thorough review of all available information, groundwater from well B-202 has never been analyzed. Well B-901 was sampled once, on January 21, 1988. Low levels of chloroform (16 $\mu\text{g/l}$) and bromodichloromethane (6 $\mu\text{g/l}$), which are commonly found in municipal water supplies that have been chlorinated, were detected; however, the reported concentrations do not exceed applicable standards. Well B-201 was advanced a total of 113 feet into the ground where refusal (bedrock) was encountered. Boring logs indicate that interbedded sands, silts, and clays were encountered to 34 feet below grade, followed by 80 feet of clay (overlying bedrock). This well is screened from 21 to 31 feet below grade, entirely below the watertable. It was sampled once on October 8, 1987, and was found to contain the following chlorinated compounds: 1,1-dichloroethene (10 $\mu\text{g/l}$); 1,1-dichloroethane (79 $\mu\text{g/l}$); both isomers of 1,2-dichloroethene (at a total of 9 $\mu\text{g/l}$); 1,1,1-trichloroethane (130 $\mu\text{g/l}$); trichloroethene (5 $\mu\text{g/l}$); tetrachloroethene (200 $\mu\text{g/l}$); and carbon tetrachloride (32 $\mu\text{g/l}$). Of these, 1,1-dichloroethene and carbon tetrachloride were detected at concentrations which exceed the applicable RCGW-2 concentrations. The source of this detected contamination is not known. Because there are no additional sampling data available from this well, the Department must consider this information to be representative of current conditions at this location. Therefore, the writer concludes that groundwater contamination in excess of applicable RCGW-2 concentrations is present within 500 feet of the Norberg well.

Scoring Disposition- Based on the above evaluation of available information, the writer concludes that the disposal site, as defined in 310 CMR 40.0006, is located within 500 feet of the Norberg well. Furthermore, based upon the Department's communications with Mr. Norberg, this well is intended only for

irrigation purposes. Therefore, as required by 310 CMR 40.1507 (1)(c) 3.ii., the Department concludes that Subsection IV.C., Private Water Supplies, shall be assigned a score of 15 points.

Possible Mitigating Conditions- As indicated above, the presence of this well should be scored as 15 points, to indicate that a non-potable irrigation well is located within 500 of the disposal site. Because (1) this well is not currently being used; (2) the well is located in an apparent cross-gradient location; (3) considering that the well is designed to collect water from fractures in the bedrock as opposed to groundwater from the saturated unconsolidated overburden deposits; and (4) the fact that 80 feet of clay separates the unconsolidated deposits from the bedrock, it may be appropriate to subtract 15 points from Section VI to indicate the disposition of this well.

Conclusions- Should this well be put into service in the future, it may become necessary to re-evaluate site scoring, or to conduct additional investigations, such as a water quality test and a revised Risk Assessment, if necessary, in order to ensure that the risks associated with this potential pathway have been adequately determined, and that this subsection of the NRS is properly scored.

SECTION V. ECOLOGICAL POPULATION:

SECTIONS	SUBMITTAL SCORE	AUDIT SCORE
A. ENVIRONMENTAL RESOURCE AREAS	80	80
B. ENVIRONMENTAL TOXICITY	<u>20</u>	<u>20</u>
TOTAL	100	100

The writer agrees with the scores assigned in Section V.

SECTION VI. MITIGATING DISPOSAL SITE-SPECIFIC CONDITIONS:

In this section, two (2) separate 10-point deductions were made. The rationale provided for these deductions is as follows:

"The site has been characterized at a level of detail greater than a Phase II Comprehensive Site Characterization. A groundwater and surface water monitoring program has been underway for the last seven years. Therefore significantly more data exists than is commonly available at the end of a Phase I study. As a result of the availability of this data, the following reductions have been made:

Under Section V.- Ecological Population, Part A, the fish habitat on-site (Jerry's Pond) score of 30 points is reduced

by 10 points (to a total of 20 points) due to data from post-Phase II investigations (Long-Term Monitoring Plan, December 1994) indicating that surface water and sediment contamination do not exist in Jerry's Pond.

Under Section V. Ecological Population, Part A, the protected open space less than 500 ft. from the site (Alewife Brook Reservation) score of 20 points is reduced by 10 points (to a total of 10 points) due to data from the Long-Term Monitoring Report indicating that the surface water contamination does not exist in Alewife Brook at locations both upstream and downstream of the site. The Reservation is also located across Alewife Brook Parkway from the site. Alewife Brook Parkway is a divided, four lane highway with no opportunity for surficial contamination from the site to impact the Reservation."

Regarding the first 10-point deduction taken in this section, the writer disagrees with the wording of the statement "... surface water and sediment contamination do not exist in Jerry's Pond.", in as much as it is not correct to state that contamination does not exist in sediments, when it has been previously recorded. According to H&A's December 1994 Long Term Monitoring report, on April 4, 1990, a sediment sample collected from Jerry's Pond was found to contain 13 $\mu\text{g}/\text{kg}$ of naphthalene, while a sediment sample collected on March 20, 1991 was found to contain 1,800 $\mu\text{g}/\text{kg}$ of naphthalene. The next (and last) sediment sample collected from Jerry's Pond did not contain detectable concentrations of naphthalene. The above statement would better express the conclusions that may be accurately drawn from these data if it had been qualified to state "contamination was not detected in the last sediment sample collected from the Pond." Furthermore, the writer is not aware of any remediation of these contaminated sediments that may have occurred since discharges to the pond from the manufacturing facility ceased in the early 1980's. In light of the above, the writer concludes that the variations in concentrations of naphthalene detected in the pond sediments could be due to temporal and/or spacial variations in these sampling events.

The writer disagrees with the second 10-point deduction, on the basis that the argument is not supported by any Technical Justification. According to the available information, a soil sample collected from B95-62 in July 1995 contained 40,700 mg/kg TPH. The contamination detected at the location of this boring, which was advanced approximately 350 feet from a Protected Open Space that encircles and includes Yates Pond, clearly demonstrates that contamination is located with 500 feet of a Protected Open Space environmental resource area. The argument is inappropriate for the following two reasons: First, if the contamination was located on or within the boundaries of a designated Protected Open

Space, then the correct score to assign would have been 30 points (310 CMR 40.1508 (1)(a) 5.c.). Because this is not the case, 20 points is the correct score to assign to the presence of the contamination at the specified location. Second, the argument focuses on direct human contact issues. Direct contact issues are scored in Section II of the NRS, not in Section V. Section V. deals with the presence or absence of specific resource areas at or within a given distance to a disposal site, not whether there are any exposure issues associated with the specified contamination. Therefore, this 10 point deduction is not supported.

Also, in Section VI., the writer recommends that the 15 points scored in Section IV.C., due to the presence of the Norberg irrigation well, be subtracted, for the reasons stated above.

NRS CONCLUSIONS

Based on the writer's scoring of the site according to 310 CMR 40.1500, the disposal site is scored at 361 points. This exceeds the 350 point cut-off between Tier II and Tier I sites.

GROUNDWATER INFILTRATION

The Department's Notice of Responsibility dated February 9, 1987, included the following requirement: "The possibility of contaminated groundwater from the site entering basements of off-[property] residential buildings must be evaluated. If such a condition can not be ruled out, mitigating measures must be considered. If it can be ruled out, the data and analysis on which that conclusion is based must be thoroughly documented. Additionally, long term monitoring must be conducted to assure that conditions do not change." This requirement was included because occasional groundwater infiltrations into basements are expected, especially in light of the fact that the site and surrounding area were formerly wetlands that have been filled and developed for both residential and industrial purposes.

To fulfill this requirement, monitoring wells were installed at the property in an effort to determine hydrologic conditions at the site. Groundwater elevation data collected from these wells indicate that, generally, groundwater flows from Jerry's Pond to the north in the direction of Whittemore Ave. However, groundwater flow is obviously significantly influenced by the MBTA redline tunnel. A review of groundwater elevation contour diagrams prepared by H&A from data collected during December 1986, February 1987, April 1987, May 1987, August 1987, October 1987, December 1987, February 1988, May 1988, September 1990, March 1991, September 1991, March 1992, September 1992, and December 1994, was conducted. These groundwater contour diagrams show that there is

a component of groundwater flow from the vicinity of B204, B205, B207, B704, B705, B707, B806 and B807 toward the MBTA tunnel. The gradient is more pronounced in earlier diagrams, and appears to become less pronounced in the later diagrams.

It is clear that groundwater from the site flows toward the north, in the direction of residences located along the north side of Whittemore Avenue. In an effort to determine if contaminated groundwater could potentially impact residential basements on Whittemore Ave, a review of groundwater quality information from wells B8, B501, B601A, B602A, B801, B802, B803, B901 and B902 was performed. The following table presents information regarding the presence/absence of VOCs in these wells on various sampling dates. Concentrations of detected VOCs are in $\mu\text{g/l}$:

B8	8/10/84, 11/26/85, 12/ 2/86 & 8/ 4/87-	no VOCs detected (ND).
B501	2/ 1/85-	1,1,1-TCA @ 26;
	11/26/85-	1,1-DCE @ 5; 1,1-DCA @ 3; carbon tetrachloride @ 13;
	12/ 2/86-	methylene chloride @ 82; 1,1,1-TCA @ 2.5;
	6/10/87-	ND.
B601A	12/ 2/86-	methylene chloride @ 54; 6/ 8/87- ND.
B602A	12/ 2/86-	methylene chloride @ 42; 6/11/87- naphthalene @ 13.
B801	6/10/87 & 11/11/87-	ND.
B802	6/ 8/87-	ND; 8/ 4/87- ND; 11/11/87- chloroform @ 2.6.
B803	6/ 8/87 & 11/11/87-	ND.
B901	1/21/88-	chloroform @ 16 and bromodichloromethane @ 5.5.
B902	1/21/86-	ND.

It should be noted that some of these samples contained very low levels of PAHs and metals, at concentrations which are presumed to approximate background conditions for groundwater in this area. As previously stated, chloroform and bromodichloromethane are commonly found in public water supplies that have been treated with chlorine. Also, methylene chloride is a very common laboratory contaminant, so the detection of methylene chloride may be the result of laboratory contamination.

Based on the above information, the writer concludes that although groundwater may occasionally infiltrate into residential basements during heavy precipitation events, there does not appear to be any potential for contaminated groundwater to impact residential basements in the Whittemore Avenue area. However, in an effort to respond to concerns from neighboring residents, and due to the fact that these downgradient wells have not been sampled in many years, the writer recommends that W.R. Grace conduct additional sampling of the wells along Whittemore Avenue. At least one additional round of groundwater quality analyses from these wells should be performed to confirm that groundwater quality is consistent with historical data, and to further demonstrate that contaminated groundwater will not impact residential basements in the neighborhood.

The writer has also evaluated the potential for contaminated groundwater to impact residential basements along Clifton and Harvey Streets. There have been reports of groundwater infiltrating into residential basements in this neighborhood since the restoration of Russell Field. These groundwater infiltrations are likely due to the fact that when Russell Field was restored by the MBTA after construction had been completed, the final grade elevation of the field was raised by almost 5 feet. This 5-foot increase in the final grade elevation of Russell Field has resulted in a loss of flood storage capacity in the vicinity of the field and Grace property, and has changed the surface water runoff characteristics in the area. In a letter from the MBTA to the City of Cambridge dated May 4, 1987, the MBTA states the following:

It is a well known fact among North Cambridge residents that the northeast corner of Russell Field along with the adjacent W.R. Grace land have historically flooded in the high water periods that typically occur throughout the year. When Russell Field was restored in 1986 by the MBTA after the Red Line Extension construction, a major effort was successfully made toward improving the field's drainage conditions, especially in recreational areas. The northeast corner of the [Grace] site, however, along with the land of adjacent property owners, is low relative to the nearby existing storm drains and surface drainage features, thus making it difficult to treat this drainage problem. The use of grade separation walls, a pump station, or a new storm drain system were beyond the responsibilities and scope of the MBTA's restoration contract.

In light of the above, the writer concludes that the flooding experienced by the Clifton/Harvey St. neighborhood since the reconstruction of Russell Field is likely the result of the alteration of surface grades and surface water flow patterns. The writer recommends that the City of Cambridge evaluate the feasibility of extending the storm drain system to the areas prone to flooding, in an effort to alleviate this situation.

Finally, with respect to the possibility that contaminated groundwater could potentially impact residences in the Clifton Street neighborhood, due to the fact that there are no monitoring wells in this area, it is not possible to determine if contaminated groundwater exists in this area. However, the overall groundwater flow direction would put this neighborhood in a cross-gradient location to the area of the most severe groundwater contamination. If W.R. Grace has demonstrated that contaminated groundwater has not/will not impact residential basements in this area, the "... data and analysis on which that conclusion is based ..." could not be located in the file. The writer recommends that the Department require W.R. Grace to provide, or re-provide as the case may be, "... the data and analysis on which that conclusion is based ...".

RUSSELL FIELD

A concern expressed by many residents in the local community is the potential for the surface soil of Russell Field to be contaminated with contaminants from the site; and thus, the opportunity for children who may be playing at the field to be exposed to contaminants at that location. Russell Field was used by the MBTA as a staging area for equipment while the Redline Extension and the Alewife parking garage were being constructed. In addition, a portion of the field was excavated in order to construct the subway tunnel between Alewife Brook Parkway and Harvey Street. Another expressed concern has been the potential for contaminated material from the Grace site to have been deposited at the field through wind borne transport.

On Monday, May 20, 1996 the writer inspected records in the possession of the MBTA regarding the MBTA's reconstruction of the field. The writer reviewed several sets of photographs of the field reconstruction activities. The first set of photos, dated March 27, 1986, showed large piles of apparently clean sand stockpiled at the location of Russell Field. These piles had a shape which was apparently formed by their deposition on the ground surface directly from dump trucks. This sandy material contained rounded gravel and cobbles indicative of deposition in a lacustrine environment, likely derived from a sand/gravel pit deposited by glacial activity.

The next set of photographs, dated April 30, 1986, showed additional sandy material dumped at the site, while grading of the field had been underway. In this set of photos, it is apparent that the new grade of the field is elevated above the previously existing and surrounding land surfaces. Contract documents in the possession of the MBTA state that Russell Field was restored at an elevation approximately 5 feet above the previously existing grade. These photos also show darker colored loam spread across portions of the fields.

The final set of photos, dated May 29, 1986, showed a full, lush carpet of grass being watered by an underground irrigation system. Due to the fact that the 4/30/86 photos show freshly spread loam and no grass whatsoever, the turf visible in the 5/29 photos must be sod, due to the fact that grass seed could not produce the lush blanket of turf visible in the photos in such a short amount of time.

The light yellow color of the deposited material indicates that it was deposited in an environment containing very little organic matter. The morphology of the visible gravel and cobbles indicate that the material was likely deposited in a high-energy environment, such as a river bed having high stream flow

velocities, or a similar fluvial environment. The geology at the site does not indicate that the above depositional environment was present at the site in the past.

Based on the photographs documenting the reconstruction of Russell Field, and because the material used to reconstruct the field is not present in the subsurface at the site, the writer concludes that the observed sandy fill was brought to Russell Field from a location other than the disposal site. It is the opinion of the writer that the field was likely reconstructed with apparently clean, sandy fill obtained from a location other than the W.R. Grace site. However, to definitively resolve the issue, a test pit/boring and environmental testing program is recommended. It is the Department's understanding that the City of Cambridge may perform such a program in the near future as part of activities associated with the improvement of the Russell Field recreational facilities.

Regarding the concern that contaminated material from the Grace site may have been transported to the surface of Russell Field through wind action, the writer offers the following comments: If there is contaminated material at the surface of the field, such material must have been transported there after the reconstruction of the field was completed in 1986. Because all process wastes placed at the site during the course of the manufacturing operations were removed in 1981 and 1982, it is not possible for process wastes to be present at the surface of Russell Field.

Public Involvement Plan Compliance

As part of this audit, BWSC/NERO Public Involvement Coordinator Karen Stromberg reviewed the Public Involvement Plan developed for the site, and public comments received on the draft Plan. Based on that review, no violations were identified. However, in responding to the comments raised during the public comment period, W.R. Grace misinterpreted section 40.1405(5)(c) of the MCP and limited their Response Summary to just the comments specifically on the draft Plan. W.R. Grace did in fact answer all other comments received in separate letters to the commentors. Because the Response Summary should have included all comments raised, W.R. Grace addressed this issue by amending Appendix G of the Plan to include all comments and responses.

It should also be noted that the Plan does not include any future public meetings. While no additional public meetings are specifically required by M.G.L. c. 21E or the MCP, the public should determine whether future meetings are held during the cleanup process. If there is sufficient interest, the Department recommends holding meetings prior to public comment periods on

specific MCP documents. This allows the public to become educated about the contents of the document, and will provide W.R. Grace with better comments. W.R. Grace is also reminded that the Information Repositories established for the site should include a complete copy of the entire site file.

AUDIT CONCLUSIONS

The writer recommends that an Audit Findings be prepared as follows:

IV. SUMMARY OF VIOLATIONS

A. Violations That Require Further Action: On the basis of the information reviewed during the audit and in reliance upon the accuracy of that information, the writer has found that W.R. Grace is in non-compliance with one or more laws, regulations, orders, permits, or approvals enforced by the Department. The activity which is in noncompliance and the actions the writer recommends W.R. Grace to take to come into compliance are described in the Noncompliance Summary contained in the Notice of Audit Findings.

V. SUMMARY OF DEFICIENCIES

A. Deficiencies that Require Further Action. The writer has identified the deficiencies listed below. Steps which should be taken to correct each deficiency are also listed.

Deficiency: In subsection VI. of the NRS, ten points were subtracted from Subsection V.A. Environmental Resources Areas. However, there is no Technical Justification for this 10 point deduction, for the reasons stated above.

Steps to be taken to correct deficiency: Revisions to the NRS scoresheet and Transmittal Form BWSC 107A should be provided to correct this deficiency. Such revisions should be provided within 30 days of the date of this correspondence.

Deficiency: The Department's NOR to W.R. Grace included the following requirement: "The possibility of contaminated groundwater from the site entering basements of off- [property] residential buildings must be evaluated. If such a condition can not be ruled out, mitigating measures must be considered. If it can be ruled out, the data and analysis on which that conclusion is based must be thoroughly documented. ..."
The Department does not have the "... data and analysis ..." which demonstrates that contaminated groundwater has not/will not impact residential basements in the Harvey Street/Clifton Street neighborhood.

Steps to be taken to correct deficiency: The Department should request that W.R. Grace provide the necessary information which demonstrates that contaminated groundwater has not/will not impact the residences in the Harvey Street/Clifton Street neighborhood.

B. Deficiencies that do not Require Action. No further steps are necessary to correct this deficiency since it was corrected prior to/during the course of the Audit.

Deficiency: In responding to the comments raised during the public comment period, W.R. Grace misinterpreted section 40.1405 (5) (c) of the MCP and limited their Response Summary to just the comments specifically on the draft Plan. W.R. Grace did in fact answer all other comments received in separate letters to the commentors. Because the Response Summary should have included all comments raised, W.R. Grace addressed this deficiency by amending Appendix G of the Plan to include all comments and responses.

Attachment B

CERTIFICATION OF SUBMITTAL (310 CMR 40.0009)

This certification must be included with your response to any request for further information or documentation

I attest under the pains and penalties of perjury, (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for wilfully submitting false, inaccurate or incomplete information.

Name (Print): _____

Position or title: _____

Signature: _____

Date: _____

Attachment C

NONCOMPLIANCE SUMMARY

ENTITY IN NONCOMPLIANCE

W.R. Grace Company-Conn.

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED

62 Whittemore Avenue, Cambridge, Massachusetts

DATE(S) WHEN NONCOMPLIANCE OCCURRED OR WAS OBSERVED

August 9, 1995

DESCRIPTION OF NONCOMPLIANCE AND THE REQUIREMENTS NOT COMPLIED WITH:

On August 9, 1995, the Department received a Tier Classification Submittal for the above-referenced location. The following violations were identified in the Numerical Ranking Scoresheet:

Violation of 310 CMR 40.1503 (2): 310 CMR 40.1503 (2) states in part "... In rendering [an LSP Tier Classification] Opinion, the LSP shall consider the data, facts and other information known about a disposal site ..." As detailed in the Department's Audit Memorandum dated July 25, 1996, all the data, facts and information were not considered in rendering the LSP Tier Classification Opinion for this disposal site.

Violation of 310 CMR 40.1505 (2)(d) and 310 CMR 40.1512 (4): 310 CMR 40.1505 (2)(d) states "310 CMR 40.1512 (4) shall be applied to establish the score for Air Exposures for Subsection II.D." 310 CMR 40.1512 (4) states that a score of 15 points shall be assigned to Subsection II.D. if: "A release, or potential release, of OHM to air has been identified;" and/or "An odor that is reasonably attributable to a release of OHM at the disposal site has been identified." Although both of these statements are true with respect to the disposal site, the corresponding score of 15 points was NOT assigned to Subsection II.D. Failure to assign the required 15 points to Subsection II.D. is a violation of 310 CMR 40.1505 (2)(d) and 310 CMR 40.1512 (4).

Violation of 310 CMR 40.1506 (1)(e) 1.: 310 CMR 40.1506 (1)(e) 1. states: "The Disposal Site Hydrogeology Score shall be indicated in Table III.D. of 310 CMR 40.1511. This score shall be based on ranges of depths to groundwater and soil permeability specified in this section as follows: (1) The highest identified seasonal groundwater level shall be used for the depth to groundwater. ..." Because the depth of groundwater below the ground surface in well B-212 in December

NONCOMPLIANCE SUMMARY

Page 2

1994 was less than 5 feet below grade, the depth to groundwater used to develop the score assigned to Subsection III.D. is not correctly identified. Failure to identify "... the highest identified seasonal groundwater level ..." and assign the appropriate score to Subsection III.D. are in violation of 310 CMR 40.1506 (1)(e) 1.

Violation of 310 CMR 40.1509(5): 310 CMR 40.1509(5) states "Section VI. of 310 CMR 40.1511 shall reference specific pages of the Phase I or other applicable Reports where the basis and Technical Justification for a score amendment are provided." Section VI of the NRS does not reference the specific pages of the applicable reports containing the Technical Justification for the score amendment to Subsection V.A., Protected Open Space. Failure to provide reference to the applicable reports is a violation of 310 CMR 40.1509 (5).

DESCRIPTION OF DEADLINE(S) OF ACTION TO BE TAKEN

Provide a revised NRS Scoresheet and Form BWSC 107A to the Department by September 27, 1996.



OFFICE OF THE CITY CLERK

CITY OF CAMBRIDGE

(617) 349-4260

FAX (617) 349-4307

tty/TDD (617) 492-0235

D. MARGARET DRURY
CITY CLERK

DONNA P. LOPEZ
DEPUTY CITY CLERK

TO: The Honorable, the City Council

FROM: ^{DMJ}
D. Margaret Drury
City Clerk

DATE: September 25, 1996

RE: Department of Environmental Protection Audit Findings, W.R. Grace Site.

The above referenced documents, DEP Audit Findings, were submitted at the September 24, 1996 meeting of the Environment Committee. Councillor Duehay has requested distribution of these findings to the City Council as soon as possible.

Communications and Reports from City
Officers #1

S-459

A communication was received from D.
Margaret Drury, City Clerk, trans-
mitting a document regarding the
Department of Environmental Protection
Audit Findings, W.R. Grace Site.

In City Council September 30, 1996

Referred to the Committee on
Environment and
the City Manager

Sent to City Manager 10/2 mc