

CMG ENVIRONMENTAL, INC.

November 17, 2005

Mr. Edwin P. Madera
Raytheon Integrated Defense Systems
528 Boston Post Road
Mail Stop 1880
Sudbury, MA 01776

**Re: Public Commentary on Draft Phase II – Comprehensive Site Assessment and
Draft Phase III – Remedial Action Plan (Phase II & Phase III)
Former Raytheon Facility, 430 Boston Post Road, Wayland MA
CMG ID 2002-003**

Dear Mr. Madera:

The following is my public commentary on the October 19, 2005 Draft Phase II and October 19, 2005 Draft Phase III for the former Raytheon facility in Wayland, Massachusetts (the Site) regarding Massachusetts Department of Environmental Protection (DEP) release tracking number (RTN) 3-22408, prepared by Environmental Resources Management (ERM). For the record, the Wayland Board of Selectmen has retained me to provide technical review of document submittals and other activities at the Site on behalf of the Town of Wayland, especially those that pertain to compliance with DEP requirements.

As in past document reviews, I have prefaced my comments with ERM's heading designations (where applicable) for ease of comparison, and used uppercase roman numerals to identify each comment.

GENERAL COMMENTS

I) At several points in both the draft Phase II and Phase III documents, ERM notes that reportable concentrations of the volatile organic compound (VOC) methyl tertiary butyl ether (MTBE) in the 'Southern Area' of the property are the direct result of a release of blended gasoline from the abutting service station located at 365 Boston Post Road. That being the case, Raytheon is entitled to assert Downgradient Property Status (DPS) in conformance with 310 CMR 40.0180 of the Massachusetts Contingency Plan (MCP) with regards to MTBE contamination in the Southern Area.

In addition, ERM also notes several times that the condition of elevated arsenic observed in groundwater at the 'Western Area' of the property is a naturally-occurring background condition. As such, Raytheon is able to submit a partial Class B-1 Response Action Outcome (RAO) Statement pursuant to 310 CMR 40.1046(1) of the MCP for the specific condition of naturally-occurring elevated arsenic in groundwater within wetlands.

The Town of Wayland concurs with ERM that the available information is sufficient for Raytheon to assert DPS in the Southern Area and submit a (partial) Class B-1 RAO for the Western Area,

600 CHARLTON STREET, SOUTHBRIDGE MA 01550
PHONE (508) 765-8510
FAX (508) 765-8515

which would ‘close out’ these aspects of RTN 3-22408. However, Raytheon has chosen not to pursue either of these options. Consequently, the MCP requires Raytheon to provide a Phase II – Comprehensive Site Assessment of all three ‘disposal site’ areas for RTN 3-22408. The ‘Northern Area’ holds the most complex environmental assessment issues by far, and Raytheon and ERM have appropriately devoted nearly all of the draft Phase II and Phase III documents to this portion of the property. Unfortunately, that means the Southern Area and Western Area aspects of RTN 3-22408 do not receive the full level of attention that the MCP mandates for Phase II assessment per 310 CMR 40.0830. Wayland recommends that Raytheon consider filing for DPS in the Southern Area regarding MTBE, and submitting a partial Class B-1 RAO Statement regarding dissolved arsenic in the Western Area, to allow ERM’s full attention for RTN 3-22408 be focused on the Northern Area issues, without distraction.

II) At Public Involvement Plan meetings and in private conversation, Raytheon and ERM have noted they have narrowed down the possible time frame for release of chlorinated VOCs in the Northern Area to between 1955 (when Raytheon took up tenancy at the Site) and 1970 (when they had the Northern Area filled. Raytheon and ERM have also stated that the approximate volume of tetrachloroethene (a/k/a perchloroethylene, or PCE) and trichloroethene (TCE) likely released to the ground surface was between 30-70 gallons. However, these two pieces of information [very pertinent to 310 CMR 40.10835(4)(c)] do not appear in either the draft Phase II or Phase III.

COMMENTS ON DRAFT PHASE II

3.5 DISPOSAL SITE BOUNDARY

III) On Page 7 of the draft Phase II, ERM notes that the ‘Northern Area Disposal Site Boundary’ extends onto the north-abutting Wayland Conservation Commission land, as illustrated on Figure 2. Wayland agrees that this is the case. However, as we noted in our April 7, 2005 public commentary on the Phase II Scope of Work document, the Town believes the ‘disposal site boundary’ for the Northern Area should encompass sample points B-411, B-412, B-413, DEP-20, and DEP-21, located on the north-abutting property. Figure 2 depicts the Northern Area disposal site boundary as including points DEP-20 and DEP-21, but not points B-411, B-412, and B-413. We again request that you identify the DEP disposal site boundaries as including all sample locations that have exhibited one or more exceedances of applicable GW-1 groundwater criteria [see 310 CMR 40.0835(4)(b) & (f)].

5.1 REGIONAL & SITE GEOLOGY

5.1.1. Unconsolidated Deposits

IV) On pages 20 & 21 of the draft Phase II, ERM provides an outstanding description of the overburden stratigraphy of the Northern Area, supported by the trio of geologic cross-section illustrations provided four times on Figure 5. However, there is no mention at all of the overburden stratigraphy in the Southern Area or the Western Area of RTN 3-22408. This goes to the point Wayland previously made in comment I. The Town requests that Raytheon provide sufficient information in this section of the Phase II report to satisfy the requirements of 310 CMR 40.0835(4)(d)3.b: to provide “a comprehensive description and depiction of site ... soil type(s), stratigraphy, and permeability.” Alternatively, Raytheon could file for DPS in the Southern Area regarding dissolved MTBE and submit a partial Class B-1 RAO Statement for dissolved arsenic in the Western Area wetlands, precluding the need to comply with the quite demanding Phase II report requirements at these portions of the property.

5.3 SOURCE, NATURE, AND EXTENT OF CONTAMINATION

5.3.1. Overview

V) The table ERM provides on page 23 of the draft Phase II indicates that the minimum concentration of OHM Release Conditions under RTN 3-22408 is “ND.” The “List of Acronyms and Abbreviations” provided on pages viii & ix prefacing the draft Phase II does not include “ND.” Common usage in this context is as an abbreviation for “Not Detected”; Wayland requests that Raytheon clarify this by either defining “ND” as a footnote to this table or by including in the preface.

More substantively, the Town requests that Raytheon either tabulate the minimum numeric value of the laboratory reporting limit for each of the ‘Release Conditions,’ or provide a statement to the effect that the minimum laboratory reporting limit is quantitatively less than the applicable RCGW-1 reportable concentration.

5.3.3. Nature and Extent of Impacts to Soil

Northern Area

VI) On page 25 of the draft Phase II, ERM notes that none of the 30 soil samples collected to 19.5 feet below grade in the Northern Area and submitted for VOC analysis exhibited any VOC detections above reportable concentrations. Wayland requests Raytheon mention that 10 of these 30 soil samples exhibited VOC identifications above laboratory reporting limits. We also note that ERM collected the deepest of these 30 soil samples (from MW-314D) at a depth of 25 feet below grade (i.e., the 19.5' sample from B-260 was not the deepest in this set).

Western Area

On page 26 of the draft Phase II, ERM notes that neither of the two soil samples from the Western Area submitted for total metals analysis exhibited any arsenic above reportable concentrations. The Town requests Raytheon mention that testing did identify 5.1 mg/Kg of total arsenic in the 25-foot sample from MW-314D.

5.3.4. Nature and Extent of Impacts to Groundwater

Southern Area

VII) On page 26 of the draft Phase II, ERM states that “MTBE impacts have been monitored for the development of a groundwater quality database, but delineation of this contaminant was not completed as part of Phase II activities.” This is a failure to comply with the specific Phase II requirement set forth at 310 CMR 40.0835(4)(f): “characterization of ... vertical and horizontal extent of contamination at the disposal site.” This also goes to the point Wayland previously made in comment I. The Town requests that Raytheon provide sufficient information in the Phase II to satisfy the requirements of this section of the MCP. Alternatively, Raytheon could file for DPS in the Southern Area regarding dissolved MTBE, precluding the need to comply with Phase II report requirements for this portion of the property.

6.1 OVERVIEW

VIII) On page 32, in the Risk Characterization chapter of the draft Phase II, ERM states that the OHM of concern “are not expected to bioaccumulate in the top two feet of soil.” While this is certainly true of the chlorinated VOCs in the Northern Area (and MTBE in the Southern Area), it may not be true of the naturally-occurring background arsenic reporting condition in the Western Area. According to the ASTDR “Toxicological Profile for Arsenic” (September 2000, p. 254):

While arsenic bioaccumulates in animals, it does not appear to biomagnify between trophic levels (Eisler 1994; Farag et al. 1998).

This again goes to the point Wayland previously made in comment I. The Town requests that Raytheon either include a clause to the effect of “apart from naturally-occurring elevated arsenic in the Western Area,” or provide the requisite ecological risk assessment information necessitated by inclusion of a bioaccumulative contaminant in the risk assessment. Alternatively, Raytheon could submit a partial Class B-1 RAO Statement for dissolved arsenic in the Western Area wetlands, precluding the need to comply with risk characterization and Phase II report requirements for this portion of the property.

6.2 SITE DESCRIPTION & ACTIVITY & USE ASSUMPTIONS

Soil Categories

IX) In the final bullet item listed on page 33 of the draft Phase II, ERM raises the possibility of removal of a portion of the (83-acre) Deed Restriction. The Town requests that Raytheon clarify that in the event of such Deed Restriction removal, Method 1 risk characterization (310 CMR 40.0970) must compare Site soils to S-1 (not S-2) standards.

More importantly, Wayland requests that Raytheon provide a discussion of whether their existing Deed Restriction can satisfy the requirements of 310 CMR 40.1012(2)(a)1 that specify an Activity and Use Limitation (AUL) must be implemented prior to submittal of an RAO Statement that does not permit unrestricted use, in any portion of a disposal site where soil exposure point concentrations exceed Method 1 risk characterization S-1 standards. As has been discussed at length in related forums, the existing Deed Restriction is not an AUL in accordance with MCP requirements, hence it may not be acceptable for a future RAO Statement to rely upon it.

COMMENTS ON DRAFT PHASE III

2.1 PHASE II SUMMARY

X) In the third Phase II conclusion, on page 4 of the draft Phase III, ERM states that “The northern boundary of the CVOC plume was delineated to levels below applicable RCs approximately 0.5 miles south of the Baldwin Pond Wellfield.” There is no similar statement found in the draft Phase II report (either in the *Conclusions* section [2.2] or *Nature and Extents of Impacts to Groundwater* section [5.3.4] of that report).

Furthermore, Figure 7 of the draft Phase II illustrates ERM’s modified Waterloo sampling point B-412 as approximately 2,430 feet (about 0.46 miles) due south of Baldwin Pond Well #3. This point exhibited 45 µg/L of TCE and 130 µg/L of cis-1,2-dichloroethene (RCGW-1 standards of 5 & 70 µg/L, respectively) in March 2004. The next-closest sampling points (DEP-9 through DEP-11) range from approximately 1,820-2,100 feet (about 0.35-0.40 miles) south of Baldwin Pond Well #3. These wells did not exhibit any RCGW-1 exceedances, although DEP-10S had detections of TCE and cis-1,2-dichloroethene.

Therefore, Wayland believes it is imprecise (if not inaccurate) to assert that the northerly boundary of the chlorinated VOC plume is “approximately 0.5 miles” of the Town wellfield. We request that Raytheon strike this language from the Phase III unless it is also presented and adequately supported in the Phase II.

4.2 SUMMARY OF TREATABILITY STUDIES

4.2.1 Bioremediation

XI) On page 11 of the Phase III, ERM indicates that “The treatability study results are not reflective of in situ conditions,” noting that the study results did not lead to complete dechlorination of TCE, whereas they have observed this in field studies. Wayland is concerned that ERM’s interpretation of the treatability study results has allowed them to extrapolate incomplete bioremediation in bench-scale testing to support a conclusion that full-scale application would achieve complete bioremediation of chlorinated VOCs; this may be overly optimistic.

The Town recommends that ERM re-do the treatability study using fine-grained material (silty sand) from the Northern Area subsurface, layered with coarser-grained materials, to better simulate in-situ conditions. However, we realize that this may not be feasible due to the need to mobilize substantial equipment in the field and the time and difficulty involved in running the anaerobic microcosm tests. As an alternative, Wayland requests that Raytheon provide additional information (such as published literature studies) to better support their assertion that bioremediation is a viable treatment alternative for the Site.

5.2.1 Source Area Saturated Soils

Alternative #1 – No Action/Institutional Controls

Effectiveness

XII) On page 21 of the Phase III, ERM states that inaction “would not achieve a permanent solution.” This seems true on face value, but in reality is based on unstated time frame considerations. Wayland requests that Raytheon clarify this statement to the effect that “this alternative would not achieve a permanent solution within MCP time frames.”

Timeliness

The Town requests that Raytheon provide some objective qualifier such as “greater than 25 years” or “on the order of 100 years” as appropriate.

Alternative #3 – Bioremediation

XIII) In the first bullet on page 24 of the Phase III, ERM states that “indigenous microbes may not be capable of complete reductive dehalogenation.” However, they have also reported detection of ethene in deep groundwater near the leading edge of the chlorinated VOC plume, an indicator that complete dehalogenation is in fact occurring in situ. Furthermore, ERM and Raytheon have selected bioremediation as the preferred alternative to address residual chlorinated VOC contamination away from the identified release source, a process that relies on microbial activity. Wayland requests that Raytheon provide a fuller and more consistent explanation of the ‘indigenous microbe’ finding.

Alternative #5 – Thermal Treatment

Risks

XIV) On Page 30 of the Phase III, ERM asserts that “There are no risks associated with the generation of toxic byproducts under this alternative that would pose short-term or long-term risks to human health.” However, they are proposing to capture vapor-phase VOCS (including PCE, TCE, and vinyl chloride) using activated carbon. Each of these VOCs can cause contaminated filter carbon to exhibit characteristic toxicity (i.e., result in a D-listed hazardous waste). By definition, a hazardous waste is capable of posing either a short-term or a long-term risk to human health.

The Town requests that Raytheon either strike this sentence, or (if possible) provide technical justification explaining why capture of chlorinated VOCs by carbon would not have any possibility of generating a hazardous waste.

5.2.2 Groundwater Plume

Alternative #1 – Monitored Natural Attenuation

Timeliness

XV) As with the second part of comment X, the Town requests that Raytheon provide some objective qualifier such as “greater than 25 years” or “on the order of 100 years” as appropriate.

Alternative #2 – Pump and Treat

Effectiveness

XVI) On Page 36 of the Phase III, ERM indicates that “The primary constituents of concern at the Site are amenable to treatment using air stripping.” This is true for the chlorinated VOCs in the Northern Area, but not MTBE (the sole contaminant of concern in the Southern Area of RTN 3-22408). Although its (unitless) Henry’s Law Constant (0.026) is greater than 0.01, air stripping is not a generally preferred method of removing MTBE from groundwater. Once more this goes to the point Wayland made in comment I. The Town requests that Raytheon modify this portion of the Phase III to address MTBE. Alternatively, Raytheon could file for DPS in the Southern Area regarding dissolved MTBE, precluding the need to comply with Phase III requirements for this portion of the property.

7.3 IMPLEMENTATION SCHEDULE

XVII) The single sentence ERM provides on page 44 of the draft Phase III provides only one tentative date, submittal of the Phase IV Remedy Implementation Plan by December 2006. This is an MCP deadline requirement rather than a schedule for implementation of the selected remedial action alternatives. Therefore, Wayland believes that Raytheon has not sufficiently met the particular Phase III requirement set forth at 310 CMR 40.0861(2)(i): “A Remedial Action Plan shall contain ...a projected schedule for implementation of Phase IV activities pursuant to 310 40.0870.” The town requests that Raytheon provide, at a minimum, a tentative schedule for the bullet items listed under Section 7.1 of the Phase III.

As always, I thank you in advance for your timely response to this commentary on behalf of the Town of Wayland.

Sincerely,
CMG ENVIRONMENTAL, INC.

Benson R. Gould, LSP, LEP
Principal

cc: Environmental Resources Management (John C. Drobinski, P.G., LSP)
Mr. J. Andrew Irwin, Wayland
Ms. Anette Lewis, Wayland
Massachusetts DEP (Pat Donahue, Larry Immerman, Karen Stromberg)
National Parks Service (% Jamie Fosberg)
Mr. Lewis Russell, Wayland
Mr. Harvey and Ms. Linda Segal, Wayland
Ms. Kimberly Tisa, U.S. EPA Region I
Wayland Board of Health PIP Repository (% Steve Calichman, Health Director)
Wayland Board of Selectmen (% Acting Executive Secretary John Senchyshyn)
Wayland Business Center, LLC (% Paula Phillips, Congress Group Ventures)
Wayland Conservation Commission (% Brian Monahan)
Wayland Public Library PIP Repository (% Ann Knight)