



DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Columbia Manufacturing Company
Facility Address: Westfield, Massachusetts 01085
Facility EPA ID #: MAD0001571

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

- X If yes - check here and continue with #2 below.
If no - re-evaluate existing data, or
if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

RCRA RECORDS CENTER
FACILITY Columbia 17K9
I.D. NO. MAD00115609
FILE NO. R-13
OTHER # 106716

**Current Human Exposures Under Control
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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

<u>Contaminated Media</u>	Potential <u>Human Receptors</u> (Under Current Conditions)						
	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>			<u>No</u>
Air (indoors)	---	---	---				
Soil (surface, e.g., <2 ft)	---	---	---	---	---	---	---
Surface Water	---	---			---	---	---
Sediment	---	---			---	---	---
Soil (subsurface e.g., >2 ft)				<u>No</u>			<u>No</u>
Air (outdoors)	---	---	---	---	---		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not “contaminated”) as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

See Attachment 2

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

- YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Columbia Manufacturing Company facility, EPA ID # MAD0001571, located at One Cycle Street, Westfield, MA under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.
- NO - "Current Human Exposures" are NOT "Under Control."
- IN - More information is needed to make a determination.

Completed by (signature) Frank R. Battaglia Date 9/19/05
(print) FRANK R. BATTAGLIA
(title) ENVIRONMENTAL ENGINEER

Supervisor (signature) [Signature] Date 10/3/05
(print) Richard P. Whelan
(title) Section Chief
(EPA Region or State) Reg. I

Locations where References may be found:

EPA REGION I RECORDS CENTER
1 CONGRESS STREET
BOSTON, MA

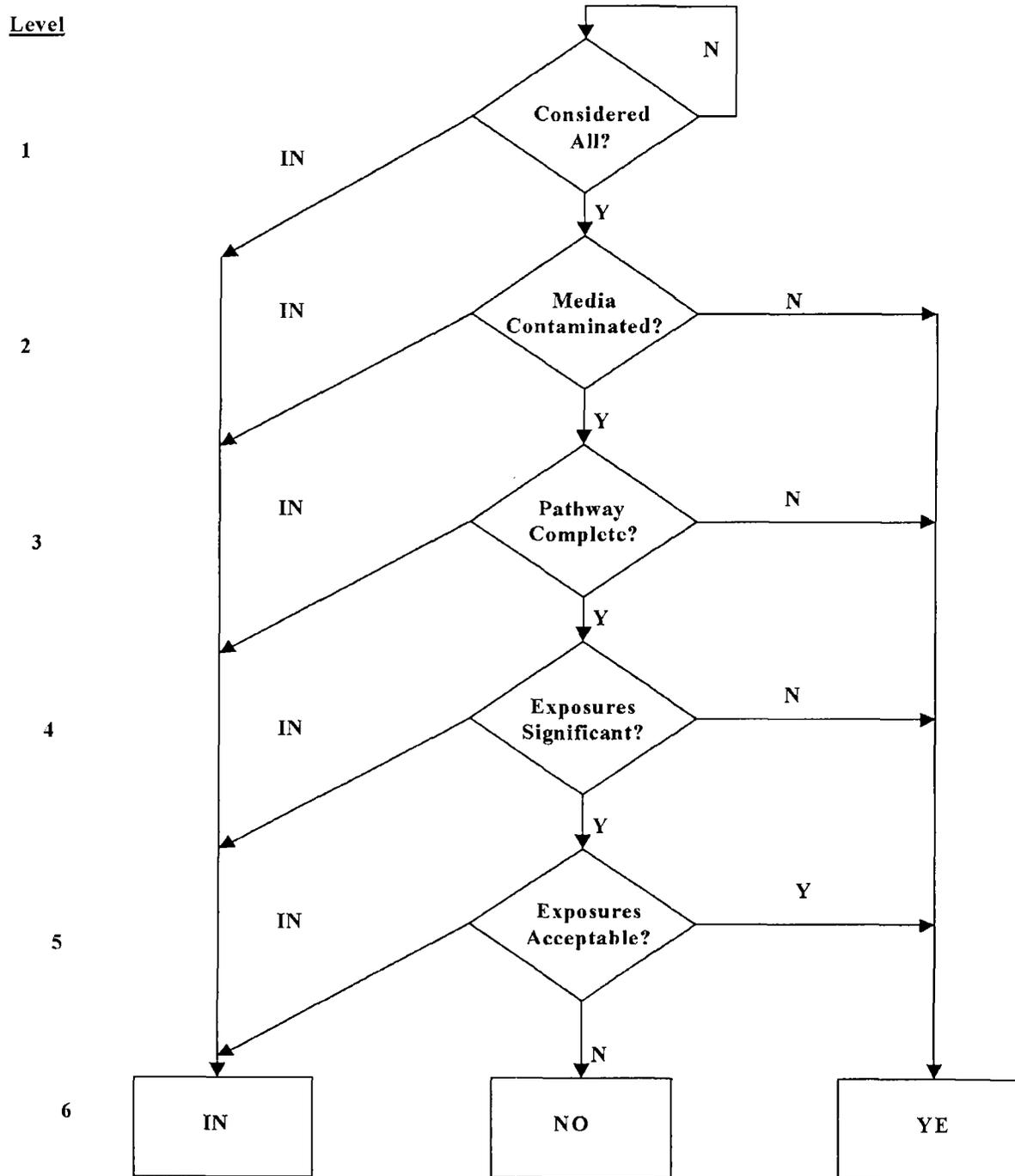
Contact telephone and e-mail numbers

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Facility Name: Columbia Manufacturing Company
 EPA ID#: MAD0001571
 City/State: Westfield, Massachusetts

CURRENT HUMAN EXPOSURES UNDER CONTROL (CA 725)



Attachment 1

Risk Question 2

Rational and References:

MTD Products Inc. (MTD) has completed investigations related to the potential release of hazardous constituents to soil and groundwater at the Columbia Manufacturing Facility site in Westfield, Massachusetts. Site investigations conducted between 1982 and 1989 primarily focused on identifying and characterizing releases from the former wastewater lagoons. Beginning in 1991, the scope of the investigations broadened to include other areas of the site identified as having a high potential for historical releases.

At the completion of Phase IIB, the horizontal and vertical extent of affected groundwater had been defined for both in the northern off-site and southern off-site areas. Subsequent groundwater sampling events conducted in 2001 and 2003 confirmed that the extent of affected groundwater migration had been defined. However, during a 2003 and 2004 groundwater sampling event, analytical data obtained from monitoring well and direct push groundwater samples identified two distinct "hot spot" areas at the facility. These areas were identified by high concentrations (parts per million) of volatile organic compounds (VOCs) in groundwater. The first hot spot is beneath the northern portion of the site in the vicinity of the former degreasing room (Building 1) while a second exists beneath Buildings 7 and 8, east of the waste water treatment room.

As a result of operations at the facility, hazardous constituents have been released to the environment. The results of the various investigations at the site have refined the constituents of potential concern (COPCs) at the site. The following table provides a list of the COPCs at the site and the associated groundwater protection standard (either United States Environmental Protection Agency [USEPA] Primary Drinking Water Standards, when available, or other applicable standards) and Massachusetts Contingency Plan (MCP) S-2 soil standards.

CONSTITUENT	GROUNDWATER ⁽¹⁾ PROTECTION STANDARD (mg/L)	MASSACHUSETTS ⁽⁴⁾ S-2 SUBSURFACE SOIL STANDARDS (mg/kg)
Tetrachloroethene	0.005	0.5
Trichloroethene	0.005	0.4
Cis-1,2-dichloroethene	0.07	2
Vinyl Chloride	0.002	0.4
Cadmium	0.005	80
Chromium	0.1	2,500
Copper	1.3 ⁽²⁾	--
Nickel	0.07 ⁽³⁾	700
Zinc	5 ⁽³⁾	2,500

⁽¹⁾ MCL; National Primary Drinking Water Standard (USEPA, June 2003)

⁽²⁾ Treatment technique at the tap Action Level; National Primary Drinking Water Standard (USEPA, June 2003)

⁽³⁾ National Secondary Drinking Water Standards (USEPA, June 2003)

⁽⁴⁾ Proposed Amendments to 310 CMR 40.0000, The Massachusetts Contingency Plan, Spring 2005

The following subsections briefly summarize the previous investigations conducted at the facility.

Wastewater Lagoon Investigations

1. **Preliminary Investigative Report (Water Management, February 1982)**

Due to changes in both federal and state laws, Water Management was contracted to assess alternate methods for disposal of metal hydroxide sludges generated from the plant's plating operations. Sludge from the lagoons was sampled and found to be nonhazardous via the EP Tox method. The Water Management report recommended closure of the lagoons, filing of a delisting application for the sludges, installation of sludge dewatering equipment, and off-site disposal of filter cake.⁽¹⁾

2. **Interim Progress Report on Remedial Investigation (Tighe and Bond Consulting Engineers Environmental Specialist [T&B] May 1986)**

This investigation included sampling of lagoon sludge, soil, and groundwater in the vicinity of the lagoons. The work was conducted as part of a condition of a Consent Order issued by the Massachusetts Department of Environmental Quality Engineering (MA DEQE) (now Massachusetts Department of Environmental Protection [MA DEP]). Volumes of soil impacted by cyanide were developed. VOCs were observed in groundwater samples collected from monitoring wells installed around the lagoons.⁽⁹⁾

3. **Phase I- Limited Site Investigation (HMM Associates, (May 1989)**

From March 30 to May 5, 1989, HMM Associates, Inc., on behalf of MA DEP, performed a Preliminary Site Assessment/Phase I Limited Site Investigation to determine if the site was a disposal site and, if so, determine its classification as a priority or non-priority site based on the regulations at the time. No samples were collected as part of this investigation. Based on review of existing site files, the facility was found to be in compliance with applicable treatment, storage, and disposal (TSD) regulations and was classified as non-priority disposal site. However, groundwater analytical data from 16 existing monitoring wells suggested potential migration of VOCs, chromium, and cyanide toward the tobacco farms south of the facility. Characterization of the extent of affected groundwater was recommended.⁽¹⁾

Site Investigations Completed Under the Consent Order

1. **RCRA Facility Assessment (RFA) Report (A.T. Kearney, Inc., May 1989)**

At the request of USEPA, A.T. Kearney, Inc. conducted a Preliminary Review/Visual Site Inspection (PR/VSI) for the facility. Additional sampling was not conducted. The PR/VSI identified 46 solid waste management units (SWMUs) and one area of concern (AOC) and made recommendations for additional investigations. Three areas were identified as having a high potential for release: the former lagoons, the storage yard runoff area, and the rim room (Building 4).⁽²⁾

2. **USEPA Investigation (November 1991)**

In November 1991, USEPA collected samples of groundwater, soil, and residual oil from the identified SWMUs and AOC. Sampling results confirmed the presence of cyanide, VOCs, and metals in soil and groundwater in the vicinity of the former lagoons. These data were used to supplement the proposal for Phase I sampling and analysis.⁽¹⁰⁾

3. **RCRA Facility Investigation (RFI) Revised Phase I Interim Report (T&B, September 1994)**

The Phase I RFI included collection and analysis of surface and subsurface soil, sediment, and/or groundwater samples from various areas of the site. Fifteen additional monitoring wells were installed to assess on-site and off-site groundwater quality conditions. The RFI identified releases to soil and/or groundwater in the vicinity of the plating operations, the wastewater treatment operations, the former lagoons, the waste storage yard, and the former reflecting pond. Based on the results of the Phase I activities, a Phase II scope of work was proposed.⁽¹¹⁾

4. **Phase I RFI Data Summary and Revised Phase II Scope of Work (O'Brien & Gere Engineers, Inc. [O'Brien & Gere], December 1995)**

The results of the Phase I were reviewed with USEPA in a meeting held in early 1996. Based on the outcome of that meeting, the results of the Phase I RFI were re-evaluated and a revised Phase II scope of work was proposed. Phase II activities were divided into two phases designated Phase IIA and Phase IIB.⁽⁵⁾

5. **Phase IIA Summary Report (O'Brien and Gere, January 1997)**

Forty-one additional monitoring wells were installed as part of the Phase IIA RFI. Elevated concentrations of VOCs and metals related to facility operations were identified in various areas of the site in both groundwater and soil. Two distinct VOC groundwater plumes were identified; one on the north side of the site associated with the maintenance area/former degreasing operations (Building 1) and one on the south side of the site associated with the waste storage yard. Off-site migration of these plumes was confirmed. In addition, free phase hydrocarbon was observed in the southern portion of the site, near the fuel aboveground storage tanks (ASTs) and the rim room (Building 4).⁽⁴⁾

6. **Phase IIB Summary Report (O'Brien and Gere, March 1998)**

Sixteen additional groundwater monitoring wells were installed and sampled as part of the Phase IIB RFI. The Phase IIB summary report concluded that the extent of the northern and southern VOC plumes in groundwater were fully characterized, and the extent of free phase hydrocarbon near the rim room and the AST farm was fully characterized.⁽⁵⁾

7. **2003 System Performance Report (RMT July 2004)**

Beginning in September 2001, RMT, on behalf of MTD, initiated remedial investigations at the site to obtain the information necessary to begin corrective measures.

A groundwater screening investigation was conducted to obtain additional information pertaining to hydrogeochemical conditions beneath the site and to refine the conceptual site hydrogeologic model. During this investigation, groundwater samples were collected from 50 existing monitoring wells. Groundwater samples were analyzed for metals, VOCs and semivolatile organic compounds (SVOCs). An additional 34 discrete-interval groundwater samples were collected using direct push techniques on the site from the northern portion of the facility and analyzed for VOCs. Additionally, 49 passive Emflux[®] soil gas probes were installed in the grassy areas on the north side of the facility, adjacent to Cycle Street. Data from this groundwater investigation was used to further define the extent of VOCs in the northern plume and aid in the design of a groundwater migration control system. The results of the soil gas sampling indicated minor VOC concentrations were present in soil gas in the area of utility lines at the northern property boundary.

Based on the interpretation of the water table surface, a groundwater divide that is oriented northeast to southwest, in the vicinity of the former plating building, has been identified at the site. As such, two separate VOC plumes were characterized, one in the northern portion of the site where groundwater is flowing toward the northeast, and one in the southern portion of the site where groundwater is flowing toward the Little River, in a south and southeasterly direction.⁽⁷⁾

8. **South End Investigations**

To better assess the results of interim corrective measures (ICMs) completed within the former plating operations (discussed below), three additional monitoring wells were installed in the southern portion of the site in 2003. Analytical results for metals collected from these wells confirmed that a decrease in concentrations detected had occurred and thus the removal of continuing sources was successful, however high concentrations of VOCs were detected in the area. A supplemental direct push investigation conducted in 2004 confirmed the concentrations and helped define the extent an area of high VOC concentrations.⁽⁶⁾

Attachment 2

Risk Question 3

Rationale and References:

Under current conditions, no exposure pathways are currently completed for any affected media. This conclusion is based on the results of the Phase II RFI Human Health Risk Assessment, as well as the completion of multiple interim corrective measures (ICMs).

The human health risk assessment conducted under the Phase IIA and IIB RFI reports concluded average exposures (on a site-wide basis) would not represent a significant risk to workers. Site risk values exceeded United States Environmental Protection Agency's (USEPA's) target risk range for industrial workers and construction workers if exposed on a daily basis to soil hot spot areas. The hot spot areas were defined as areas of concern (AOCs) and source areas under the building. Through ICMs described below, all of the hot spot exposed soils have been removed. In addition, groundwater treatment beneath the building through the use of *in situ* oxidation is currently ongoing. At this time, no construction activities are occurring in the areas of the facility where affected soil has been observed.^(4, 3)

ICMs have been completed or are in the process of completion for all solid waste management units (SWMUs) and AOCs identified in the Phase I and Phase II RFI reports. Many of the SWMUs/AOCs listed were located within the production facility or in the southern portion of the site. Changes in production processes (cleanout and closure of trenches and sumps, installation of secondary containment, abandonment of underground storage tanks [USTs] and removal of aboveground storage tanks [ASTs], etc.) have facilitated the remediation process. In addition to changes in production processes, SWMUs and AOCs located outside, in the southern portion of the facility, were remediated. From 1998 through 2001, affected surface and subsurface soil were removed to the water table, and replaced by clean fill in the following areas in the southern portion of the facility:

- Former chrome plating room
- Former zinc plating room
- Alley between Building 3 and Buildings 4 and 5
- Wastewater room
- Former rim room
- Former wastewater lagoons
- Former fire pond
- Former fuel storage area
- Former incinerator/scrap metal fill area
- Former storage yard

In addition to changes in production processes and soil removal, groundwater remediation has been conducted. Groundwater in the northern portion of the facility is controlled by a seven well groundwater migration control system, which was installed along the northern property boundary (Cycle Street), between Cleveland Avenue and South Meadow Road. The system, installed in 2002, creates a hydraulic control, preventing the flow of volatile organic compound (VOC)-affected groundwater to off-site areas. By preventing the flow of VOC affected groundwater to off-site locations in the northern portion of the facility, the potential for vapor migration from groundwater into off-site crawl spaces or

basement areas has been eliminated. To ensure the continued effectiveness of the groundwater migration control, regular groundwater level monitoring and groundwater sampling will be conducted at the site.

Additionally, groundwater is not used for drinking water or irrigation in the vicinity of the site. A public and private supply well surveys were conducted as part of the Phase IIA and Phase IIB RFI investigations. The reports did not identify any public water supply wells within one mile of the site. The closest was located more than a mile south of the site across the Little River. An extensive private well survey was conducted for locations within ½ mile of the site. One private well, used for irrigation, was identified within the area. VOCs were not detected in samples collected from the well. Potable water is supplied to all homes in the area by an 8-inch water main supplied by the Westfield Water Department. At this time, no construction activities are occurring in the areas of the facility where affected soil has been observed.⁽⁴⁾

Groundwater in the southern portion of the facility flows to the southeast and discharges into the Little River. The sampling of off-site monitoring wells during the Phase IIB investigations indicated the off-site extent of affected groundwater has been defined. Subsequent groundwater monitoring events conducted in 2001 and 2003 confirmed that VOC and metals affected groundwater is not impacting the Little River.

In addition, groundwater flow and transport modeling conducted as part of the Phase IIA and Phase IIB RFI investigation concluded that VOC impacted groundwater does not impact the Little River. Groundwater modeling conducted as part of the *Final Design-In situ Oxidation of Chlorinated Volatile Organic Compounds in Groundwater* (RMT June 2004) concluded neither VOC or metals affected groundwater presently impact the Little River. The modeling results indicated VOC or metals affected groundwater would stay within the existing monitoring network and would not impact the Little River in the foreseeable future.⁽¹⁰⁾

Attachment 3

References

- (1) HMM Associates, Inc. 1989. *Phase I – Limited Site Investigation, Columbia Manufacturing Company, 1 Cycle Street, Westfield, Massachusetts, Site No. 1-232, May 8, 1989, prepared for the Massachusetts Department of Environmental Quality Engineering* (Concord, Massachusetts, 1989).
- (2) Kearney, Inc., A.T. 1989. *RCRA Facility Assessment, Preliminary Review/Visual Site Inspection Report of the Columbia Manufacturing Facility, Westfield, Massachusetts, May 1989* (Alexandria, Virginia, 1989)
- (3) O'Brien & Gere Engineers, Inc. 1998a. *Phase IIB Summary Report for The Columbia Manufacturing Inc. Site* (Braintree, Massachusetts, March 11, 1998).
- (4) O'Brien & Gere Engineers, Inc. 1997. *Phase IIA Summary Report for The Columbia Manufacturing Inc. Site* (Braintree, Massachusetts, January 22, 1997).
- (5) O'Brien & Gere Engineers, Inc. 1998b. *Phase I RFI Data Summary and Revised Phase II Scope of Work for The Columbia Manufacturing Inc. Site* (Braintree, Massachusetts, December 12, 1998).
- (6) RMT Consulting Engineers P.C. 2004a. *Workplan for Accelerated Site Closure, MTD Products Inc - Columbia Manufacturing Facility Site, Westfield Massachusetts* (Greenville, South Carolina, Westfield Massachusetts, March 12, 2004).
- (7) RMT Consulting Engineers P.C. 2004b. *2003 System Performance Report, MTD Products Inc. - Columbia Manufacturing Facility Site, Westfield Massachusetts* (Greenville, South Carolina, June 25, 2004).
- (8) RMT Consulting Engineers P.C. 2004c. *Final Design – In situ Oxidation of Chlorinated Volatile Organic Compounds (CVOs) in Groundwater, MTD Products Inc - Columbia Manufacturing Facility Site, Westfield Massachusetts* (Greenville, South Carolina, June 25, 2004).
- (9) Tighe & Bond, Inc., Consulting Engineers. 1986. *Technical Report, Interim Progress Report on Remedial Investigations, Columbia Manufacturing Company, May 1986* (Westfield, Massachusetts, 1986).
- (10) Tighe & Bond, Inc., Consulting Engineers. 1993a. *Technical Report, RCRA Facility Investigation Proposal, Columbia Manufacturing Company, Volume 1 and II* (Westfield, Massachusetts, June 1993).
- (11) Tighe & Bond, Inc., Consulting Engineers. 1993b. *Technical Report, Columbia Manufacturing Company, Inc. Facility Design Report* (Westfield, Massachusetts, November 10, 1993).