

**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:** Thomas and Betts Corporation  
**Facility Address:** Park Ave. & Ridge Rd., Perkasio, PA 18944  
**Facility EPA ID #:** PAD002498699

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, GPRAs). 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.,

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)**

RCRIS status codes must be changed when the regulatory authorities become aware of contrary information). Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

|                             | <u>Yes</u> | <u>No</u> | <u>?</u> | <u>Rationale / Key Contaminants</u>   |
|-----------------------------|------------|-----------|----------|---|
| Groundwater                 | x          |           |          | Trichloroethene (TCE), a volatile organic compound (VOC), found in groundwater at concentrations above the federal maximum concentrations level (MCL) (Interim Measures Status Report, Former Thomas & Betts/Ansley Facility, October 18, 2004).                      |
| Air (indoors) <sup>2</sup>  |            | x         |          | No documentation of releases  |
| Surface Soil (e.g., <2 ft)  |            | x         |          | VOCs and RCRA metals found in surface soil samples at concentrations below the EPA Region 3 residential soil direct contact RBCs and EPA typical clean up standard (Soil Investigation Interim Report, Former Thomas and Betts/Ansley Facility, January 10, 2005)     |
| Surface Water               |            | x         |          | Wastewater discharge is monitored by NPDES Permit   |
| Sediment                    |            | x         |          | No documentation of releases  |
| Subsurf. Soil (e.g., >2 ft) |            | x         |          | VOCs and RCRA metals found in sub-surface soil samples at concentrations below the EPA Region 3 residential soil direct contact RBCs and EPA typical clean up standard (Soil Investigation Interim Report, Former Thomas and Betts/Ansley Facility, January 10, 2005) |
| Air (outdoors)              |            | x         |          | No documentation of releases  |

\_\_\_\_\_ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):**

**Background:**

The former T&B/Ansley facility is an approximate 5-acre parcel located at 1501 West Park Avenue, Perkasio, PA. T&B manufactured printed circuit board from 1966 to 1985. The circuit manufacturing processes included copper deposition, panel plating, pattern plating, etching and tab plating. Each of these general processes consists of several individual steps that incorporate a variety of acid solution, alkali and alkaline cleaners, and dissolved metal plating baths. Upon completion of each step of the board manufacturing process, the board is rinsed with water before proceeding to further processing. These rinse waters represent a potential aqueous waste containing diluted concentrations of the above process materials. In the circuit board manufacturing process, TCE was used as a solvent in the final cleaning stages of the manufacturing process. In 1980, onsite soil was found to be contaminated with TCE at concentration as high as 5140 ppb. In 1982, groundwater underneath the facility was found contaminated with TCE at concentration as high as 3093 ug/l. On August 17, 2001, the Environmental Protection

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**

Page 3

Agency (EPA) and Thomas & Betts (T&B) entered into an Administrative Order on Consent (Order) pursuant to Section 7003 of the Resource Conservation and Recovery Acts of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. Section 6973 which requires T&B to conduct a facility-wide investigation of on-site and off-site contamination, to perform interim measures, to evaluate potential clean-up alternatives, as well as to implement the selected alternative.

On February 10, 2002, EPA approved T&B's Interim Measures (IM) Workplan. The approved IM Workplan calls for quarterly samplings and analyses of drinking water wells located within 1/4 mile radius of the facility and to connect wells that exceed MCLs to a public water supply. On March 7, 2003, EPA approved T&B's RFI Workplan. Facility's soil and groundwater investigations have been conducted in accordance with the approved RFI workplan. On March 28, 2003, EPA approved T&B's IM Report. On August 26, 2005, EPA approved T&B's Interim Measures Status Report which allows a reduction of frequency of sampling and analysis of private drinking water wells from quarterly to semi-annual. On November 4, 2005, EPA approved T&B's Soil Investigation Interim Report.

**Groundwater:**

Groundwater underneath T&B facility was found contaminated with TCE at concentration as high as 2420 ug/l, above the MCL of 5 ug/l (Thomas & Betts Corporation, Perkasio, Pennsylvania, Groundwater Remediation 2003 Annual Report). The groundwater contamination migrated offsite and impacted drinking water wells in the vicinity of the facility. In accordance with the approved Interim Measure Workplan (IM Workplan), in 2002 and 2003, T&B collected groundwater samples from drinking water wells located within 1/4 mile radius of the T&B property and analyzed these samples for VOCs. VOCs including 1,1-dichloroethane, cis-1,2-dichloroethene, 1,1-dichloroethene, and TCE were detected in drinking water wells at concentrations as high as 0.2 ug/l, 0.4 ug/l, 0.2 ug/l, and 8.0 ug/l. The MCLs for 1,1-DCE, cis-1,2-DCE and TCE are 7 ug/l, 70 ug/l and 5 ug/l, respectively. The EPA Region 3 Tap Water RBCs for 1,1-DCA is 900 ug/l. 1,1-DCE and cis-1,2-DCE were detected at concentrations below the respective MCLs. 1,1-DCA was detected at concentration below the respective EPA Region 3 Tap Water RBC. TCE was detected at concentration above the MCL of 5 ug/l (Interim Measures Status Report, Former Thomas & Betts/Ansley Facility, October 18, 2004).

The concentrations of VOCs detected in groundwater and the corresponding MCLs and EPA Region 3 RBCs are summarized in Table 1 as follows:

**Table 1**

| VOCs                   | Results (ug/l) | MCLs (ug/l) | EPA Region 3 RBCs (ug/l) |
|------------------------|----------------|-------------|--------------------------|
| 1,1-Dichloroethane     | 0.2            |             | 900                      |
| cis-1,2-Dichloroethene | 0.4            | 70          |                          |
| 1,1-Dichloroethene     | 0.2            | 7           |                          |
| Trichloroethene        | 8.0            | 5           |                          |

**Surface Soil**

Surface soil samples were collected and analyzed in accordance with the approved RFI workplan. VOCs including cis-1,2-Dichloroethene and trichloroethene, were detected in the surface soil samples at concentrations as high as 9.7 ug/kg and 14 ug/kg, respectively, below the Region 3 Residential soil direct contact risk based concentrations of 780,000 ug/kg and 1,600 ug/kg, respectively. RCRA metals including chromium (total), lead, nickel, tin, and zinc were detected in surface soil samples at concentrations as high as 53.4 mg/kg, 66.8 mg/kg, 31 mg/kg, 84.1 mg/kg, and 77.3

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)**

Page 4

mg/kg, respectively. The Region 3 Residential soil direct contact RBCs for chromium VI, nickel, tin, and zinc are 230 mg/kg, 1600 mg/kg, 47000mg/kg, and 23000mg/kg. The detected concentrations of chromium, nickel, tin, and zinc are below the respective RBCs. EPA typically sets residential clean up level of lead at 400 mg/kg. The detected concentration of lead is below the EPA typical clean up standard (Soil Investigation Interim Report, Former Thomas and Betts/Ansley Facility, January 10, 2005).

The concentrations of VOCs detected in surface soil and the corresponding EPA Region 3 Residential soil direct contact RBCs are summarized in Table 2 as follows:

**Table 2**

| VOCs                   | Results (ug/kg) | EPA Region 3 Residential Soil RBC (ug/kg) |
|------------------------|-----------------|---|
| cis-1,2-Dichloroethene | 9.7             | 780,000                                   |
| Trichloroethene        | 14              | 1,600                                     |

The concentrations of RCRA metals detected in surface soil and the corresponding EPA Region 3 Residential soil direct contact RBCs and the EPA typical clean up level are summarized in Table 3 as follows:

**Table 3**

| RCRA Metals | Results (mg/kg) | EPA Region 3 Residential Soil RBCs (mg/kg) | EPA Typical Clean Up Standard |
|-------------|-----------------|--|-------------------------------|
| Chromium    | 53.4            | 230  |                               |
| Lead        | 66.8            |  | 400                           |
| Nickel      | 31              | 1600                                       |                               |
| Tin         | 84.1            | 4700                                       |                               |
| Zinc        | 77.3            | 2300                                       |                               |

**Sub-surface soil**

Sub-surface soil samples were collected and analyzed in accordance with the approved RFI workplan. VOCs including cis-1,2-Dichloroethene, 1,1,1-Trichloroethane, and Trichloroethene were detected in the sub-surface soil samples at concentrations as high as 830 ug/kg, 3.7 ug/kg, and 4100 ug/kg, respectively, below the Region 3 Residential soil direct contact risk based concentrations of 780,000 ug/kg, 22,000,000 ug/kg, and 1,600 ug/kg, respectively. RCRA metals including chromium (total), lead, nickel, tin, and zinc were detected in sub-surface soil at concentrations as high as 34.7 mg/kg, 27.2 mg/kg, 58.7 mg/kg, 13.2 mg/kg, and 121 mg/kg, respectively, below the EPA region 3 residential soil direct contact RBCs and EPA typical clean up standard. (Soil Investigation Interim Report, Former Thomas and Betts/Ansley Facility, January 10, 2005).

The concentrations of VOCs detected in sub-surface soil and the corresponding EPA Region 3 residential soil direct contact RBCs are summarized in Table 4 as follows:

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)**

Page 5

**Table 4**

| VOCs                   | Results (ug/kg) | EPA Region 3 Residential Soil Direct Contact RBCs |
|------------------------|-----------------|---|
| cis-1,2-Dichloroethene | 830             | 780,000   |
| 1,1,1-Trichloroethane  | 3.7             | 22,000,000  |
| Trichloroethene        | 4100            | 1600  |

The concentrations of RCRA metals detected in sub-surface soil and the corresponding EPA Region 3 residential soil direct contact RBCs and EPA typical clean up standard are summarized in Table 5 as follows:

**Table 5**

| RCRA Metals | Results (mg/kg) | EPA Region 3 Residential Soil Direct Contact RBCs (mg/kg) | EPA Typical Clean Up Standard (mg/kg) |
|-------------|-----------------|---|---------------------------------------|
| Chromium    | 34.7            | 230   |                                       |
| Lead        | 27.2            |   | 400                                   |
| Nickel      | 58.7            | 1600  |                                       |
| Tin         | 13.2            | 47000   |                                       |
| Zinc        | 121             | 23000   |                                       |

**Air (indoors)**

No documentation of release

**Air (outdoor)**

No documentation of releases

**Sediment**

No documentation of releases

**Footnotes:**

<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)**

unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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**

Potential **Human Receptors** (Under Current Conditions)

| <b>“Contaminated” Media</b>   | Residents | Workers | Day-Care | Construction | Trespassers | Recreation | Food <sup>3</sup> |
|-------------------------------|-----------|---------|----------|--------------|-------------|------------|-------------------|
| Groundwater                   | no__      | no__    | no__     | no__         |             |            | no_               |
| Air (indoors)                 | ___       | ___     | ___      |              |             |            |                   |
| Soil (surface, e.g., <2 ft)   | ___       | ___     | ___      | ___          | ___         | ___        | ___               |
| Surface Water                 | ___       | ___     |          |              | ___         | ___        | ___               |
| Sediment                      | ___       | ___     |          |              | ___         | ___        | ___               |
| Soil (subsurface e.g., >2 ft) |           |         |          | ___          |             |            | ___               |
| 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.

**X**\_\_\_ 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):**

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**

Page 7

In accordance with the EPA-approved IM workplan, of the drinking water wells located within 1/4 mile radius of the facility's property, T&B connected wells that have TCE detected at concentrations above the MCL to a public water supply, the remaining wells that have TCE detected at concentrations below the MCL are monitored in accordance with the approved Interim Measures Report and Interim Measures Status Report. Exposure pathway to contaminated groundwater is not complete.

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

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

\_\_\_\_\_ If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

**Rationale and Reference(s):**

<sup>4</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

\_\_\_\_\_ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

\_\_\_\_\_ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially

“unacceptable” exposure.

\_\_\_\_\_ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

**Rationale and Reference(s):**

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):

X\_\_\_\_\_ 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 Thomas & Betts facility, EPA ID # PAD002498699\_, located at Park Ave. & Ridge Rd., Perkasio, PA 18944 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) \_\_\_\_\_ Date \_\_\_\_\_  
(print) Tran Tran  
(title) RCRA Project Manager

Supervisor (signature) \_\_\_\_\_ Date \_\_\_\_\_  
(print) Paul Gotthold  
(title) Chief, PA Operations Branch  
(EPA Region or State) EPA Region 3

**Locations where References may be found:**

US EPA Region III  
1650 Arch Street  
Philadelphia, PA 19103

**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.**