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: Thermo King de Puerto Rico, Inc.
Facility Address: B Street, Zeno Gandía Industrial Park, Hato Abajo, Arecibo, Puerto Rico
Facility EPA ID #: PRD090497959

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) (1) 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).

Facility Information

Thermo King produces solenoids, wire harnesses, control boxes, plastic in-lays, and evaporators for transport refrigeration units. Activities performed on-site by Thermo King included metal shearing, refrigerant copper coil forming and assembly, metal punching, bending, welding, painting, and electrical wire harness and metal finishing. The current land use of the facility is industrial. The manufacturing buildings shown the maps provided in Attachment A are all occupied.

Periodic ground water monitoring for volatile organic compounds (VOCs) has been conducted at the Thermo King facility from December 1999 through November 2012. Several VOCs in excess of the EPA Maximum Contaminant Levels (MCLs) have been detected in the shallow and deep aquifers, as well as in three identified perched water zones. 1,1-Dichloroethene (1,1 – DCE) is the primary contaminant of concern at the site based on its concentration in ground water relative to other detected contaminants.

AVAILABLE AND RELEVANT INFORMATION

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?

☒ YES, continue with #2 below.
☐ NO, re-evaluate existing data or, if data are not available, skip to #6 and enter “IN” (more information needed) status code.

Rationale

Additional site work was conducted in 2012, including the installation of downgradient extent monitor well MW-15S and a soil vapor extraction (SVE) well SVE-1. A SVE pilot test was also conducted and ground water quality is monitored annually. The results of the August 2012 SVE pilot test confirm that there is recoverable contaminant mass within the unsaturated zone beneath the former 1,1,1-TCA tank area. Results of annual ground water monitoring show that the lateral extent of ground water contamination has been defined. The information collected in 2012 along with existing site information provides an effective Site Conceptual Model that can be applied to site remediation efforts.
MEDIA

2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be “contaminated”\(^1\) 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)?

<table>
<thead>
<tr>
<th>Media</th>
<th>Yes</th>
<th>Rationale/Key Contaminants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>YES</td>
<td>VOCs in ground water in source area. Several VOCs have been detected in excess of the EPA Maximum Contaminant Levels (MCLs) in the shallow and deep aquifers, as well as in perched water zones. 1,1-DCE is the primary contaminant of concern at the site based on its concentration in ground water relative to other detected contaminants. 1,1-DCE is a degradation product of 1,1,1-TCA which was stored in tanks and dispensed at the source area. Information summarizing site investigation work is presented in Attachment A.</td>
</tr>
<tr>
<td>Air (indoors)(^2)</td>
<td>NO</td>
<td>Air monitoring data not available. Vapor intrusion has been eliminated as a potential exposure based on the distance from contaminated media to potential receptors, the concentrations of contaminants, and the depth to ground water (see following section).</td>
</tr>
<tr>
<td>Surface Soil (e.g., &lt;2 ft)</td>
<td>NO</td>
<td>Six shallow soil samples were collected from the former 1,1,1-TCA tank area as part of the waste characterization for the new wastewater treatment plant foundation excavation. VOCs were not detected in any of the soil samples. The results indicate that there is not a potential exposure pathway associated with shallow soil in this area.</td>
</tr>
<tr>
<td>Surface Water</td>
<td>NO</td>
<td>No surface water bodies have been identified within the footprint of the ground water contaminant plume. Ground water is not expected to discharge to nearby downgradient surface water bodies due to the depth to ground water (&gt;120 feet). The nearest surface water body is the Atlantic Ocean 1 mile north (downgradient) of the facility. Surface water bodies are shown in the maps provided in Attachment A.</td>
</tr>
<tr>
<td>Sediment</td>
<td>NO</td>
<td>No sediments identified within the footprint of the ground water contaminant plume.</td>
</tr>
<tr>
<td>Subsurface Soil (e.g., &gt;2 ft)</td>
<td>YES</td>
<td>The available soil analytical data, along with additional soil vapor data collected during the August 2012 SVE pilot test, indicate that residual VOCs remain in unsaturated soil within the source area. Information summarizing site investigation work is presented in Attachment A.</td>
</tr>
<tr>
<td>Air (Outdoor)</td>
<td>NO</td>
<td>Outdoor air sampling data not available, but preliminary modeling of indoor air vapor intrusion shows that this exposure pathway is not complete. It is reasonable then to assume the outdoor air exposure pathway is also not complete.</td>
</tr>
</tbody>
</table>

\(^1\) “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).

\(^2\) Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggests that 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.
☐ 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.

☑ 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.

☐ UNKNOWN (for any media) – skip to #6 and enter “IN” status code.

**Rationale**

See Attachment A for soil and ground water quality data

**PATHWAYS**

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?

**Table 1 – Summary Exposure Pathway Evaluation Table for Potential Human Receptors (Under Current Conditions)**

<table>
<thead>
<tr>
<th>Contaminated Media</th>
<th>Potential Human Receptors (Under Current Conditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Residents</td>
</tr>
<tr>
<td>Groundwater</td>
<td>NO</td>
</tr>
<tr>
<td>Air (indoors)</td>
<td>NO</td>
</tr>
<tr>
<td>Surface Soil (&lt;2 ft)</td>
<td>NO</td>
</tr>
<tr>
<td>Surface Water</td>
<td>NA</td>
</tr>
<tr>
<td>Sediment</td>
<td>NA</td>
</tr>
<tr>
<td>Subsurface Soil (&gt;2 ft)</td>
<td>NO</td>
</tr>
<tr>
<td>Air (Outdoor)</td>
<td>NO</td>
</tr>
</tbody>
</table>

Instructions for Summary Exposure Pathway Evaluation Table:

- Select “NA” for specific Media (including Human Receptors’ spaces for Media which are not “contaminated”) as identified in #2 above.

- 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) are defaulted to

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)
“NA”. While these combinations may not be probable in most situations they may be possible in some settings and should be changed as necessary.

☐ 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).

☑ YES (pathways are complete for any “Contaminated” Media – Human Receptor combination) – continue after providing supporting explanation.

☐ UNKNOWN (for any “Contaminated” Media – Human Receptor combination) – skip to #6 and enter “IN” status code

Rationale

Air (Indoor) – No indoor air monitoring data has been collected. However, There are no occupied buildings within 100 feet of the area of identified contaminated soil. The ground water to indoor air vapor intrusion pathway is also incomplete because the depth to ground water is over 120 feet below ground surface. Contaminated perched water lenses do not extend beneath occupied buildings, and are over 75 feet deep which makes the indoor air vapor intrusion pathway very improvable to be complete. However, it should be noted that per U.S. EPA Environmental Indicator guidance on vapor intrusion (http://www.epa.gov/epawaste/hazard/correctiveaction/eis/faqs.htm#vapor), U.S. EPA yields to the authority of the Occupational Safety and Health Administration (OSHA) when enforcing worker exposure to hazardous concentrations of chemicals in workplaces such as Thermo King where workers are handling hazardous chemicals. Under the OSHA General Duty clause, workers present inside the Thermo King structures known to contain hazardous indoor air vapor concentrations of 1,1-DCE are to be provided adequate monitoring, engineering controls, and/or personal protective equipment (PPE) to prevent unnecessary occupational exposure.

Ground water - The potential exists for a complete exposure pathway for workers during ground water monitoring and other site assessment activities. A survey was conducted in the area surrounding the site to assess the presence of existing ground water supply wells. The results of the survey showed that there were no existing wells within the survey area that would be impacted by the site contaminant plume. Results of the survey are presented in Attachment B.

Subsurface soil - The potential exists for a complete exposure pathway for workers during subsurface activities such as excavation. There is no potential for construction worker exposure to contaminated ground water due to the depth to water (ground water >120 feet, perched water >75 feet).

Air (Outdoor) – No outdoor air monitoring data has been collected. However, the source area soils are capped by the wastewater treatment plant cement slab. In addition, the depth to ground water and perched water, along with the concentrations of contaminants in ground water, effectively eliminate this exposure pathway.
SIGNIFICANT EXPOSURES

4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be “significant”\(^4\) (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?)

☑ NO (exposures cannot 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.”

☐ 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.”

☐ UNKNOWN (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale

Exposure to both contaminated soil and ground water as indicated in Section 4 will be limited to experienced personnel with the appropriate HAZWOPER training and using the appropriate personal protective equipment and monitoring tools. The results of a well survey completed in April 2013 of the surrounding area showed that no water supply wells are present in the study area. Vapor intrusion has been eliminated as a potential exposure based on the distance from contaminated media to potential receptors, the concentrations of contaminants, and the depth to ground water as detailed in previous sections.

ACCEPTABLE LIMITS

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

☐ 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).

\[^4\] 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.
☐ 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.

☐ UNKNOWN (for any potentially “unacceptable” exposure) – continue and enter “IN” status code

Rationale

Section is not applicable because no significant exposures have been identified.

DETERMINATION

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 Thermo King de Puerto Rico, Inc. facility, EPA ID #EPA ID: 110000580390, located at B Street, Zeno Gandia Industrial Park, Hato Abajo, Arecibo, Puerto Rico 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) Luis Negron Date 10/23/13
(print) Luis Negron (title) Env. Engineer

Reviewed by (signature) Jesse Aviles Date 2013-10-31
(print) Jesse Aviles (title) Env. Scientist

Supervisor (signature) Ramon Torres Date 12/4/13
(print) Ramon Torres (title) CEPD RRB Branch Chief

EPA Region or State 2
Contact telephone and email:

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References


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.
Attachment A
Soil and Ground Water
Quality Data
SOIL BORING MAP - SITEWIDE

MONITOR WELL
SOIL BORING
CONE PENETROMETER BORING
FORMER DEGREASER

>1 mg/kg 1,1-DCE IN SOIL

ESTIMATED EXTENT OF VOC-AFFECTED SOIL

DEPTH TO GROUND WATER ~129 ft BGS
LEGEND

- MONITOR WELL
- SVE WELL
- FORMER VAPOR DEGREASER
- FORMER SOLVENT DISPENSER
- IDENTIFIED KARST FLOW SYSTEM

1,1-DCE TREND vs TIME

Well (μg/l) | 1,1-DCE
---|---
MW-3 | 3,600
MW-4 | 370
MW-9 | 63,000
MW-13 | 300
MW-14 | 160

MW-9
MW-3
MW-13
MW-14
MW-8 S/D
SVE-1

1,1-DCE IDENTIFIED KARST FLOW SYSTEM

SVE WELL

GROUNDF WATER ANALYTICAL RESULTS – 1,1-DCE (11/2012)
SOURCE AREA PERCHED WATER

Environmental Resources Management

FIGURE 7
**GROUND WATER ANALYTICAL RESULTS – 1,1-DCE (11/2012)**

**SURFICIAL AQUIFER**

**THERMO KING DE PUERTO RICO**

<table>
<thead>
<tr>
<th>Well (µg/l)</th>
<th>1,1-DCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shallow Aquifer</strong></td>
<td></td>
</tr>
<tr>
<td>MW-1S</td>
<td>3.9</td>
</tr>
<tr>
<td>MW-6S</td>
<td>6.0</td>
</tr>
<tr>
<td>MW-8S</td>
<td>1,400</td>
</tr>
<tr>
<td>MW-8S (dup)</td>
<td>1,700</td>
</tr>
<tr>
<td>MW-15S</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Deep Aquifer</strong></td>
<td></td>
</tr>
<tr>
<td>MW-1D</td>
<td>11</td>
</tr>
<tr>
<td>MW-2D</td>
<td>7.7</td>
</tr>
<tr>
<td>MW-6D</td>
<td>0.45 J</td>
</tr>
<tr>
<td>MW-8D</td>
<td>26</td>
</tr>
</tbody>
</table>

**1,1-DCE TREND vs TIME**

**MONITOR WELL**

**SVE WELL**

**FORMER VAPOR DEGREASER / DISPENSER**

**IDENTIFIED KARST FLOW SYSTEM**

**1,1-DCE**

- >10,000 µg/l
- 1,000-10,000 µg/l
- 100-1,000 µg/l
- 7-100 µg/l
- <7 µg/l
<table>
<thead>
<tr>
<th>Results in mg/kg</th>
<th>Depth (ft BGS)</th>
<th>Date</th>
<th>Vinyl Chloride</th>
<th>1,1-DCE</th>
<th>1,1-DCA</th>
<th>1,1,1-TCA</th>
<th>Benzene</th>
<th>1,2-DCA</th>
<th>TCE</th>
<th>1,4-Dioxane</th>
<th>Toluene</th>
<th>Ethyl benzene</th>
<th>Total Xylenes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB-1</td>
<td>7-8</td>
<td>12/03/02</td>
<td>ND</td>
<td>0.014</td>
<td>0.022</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.018</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-2</td>
<td>8-8.5</td>
<td>12/03/02</td>
<td>ND</td>
<td>0.005</td>
<td>0.013</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.002 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-3</td>
<td>11-12</td>
<td>12/03/02</td>
<td>ND</td>
<td>0.004</td>
<td>0.010</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.002 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-4</td>
<td>8-9</td>
<td>12/03/02</td>
<td>ND</td>
<td>0.310</td>
<td>0.098</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.002 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-5</td>
<td>3-4</td>
<td>12/13/02</td>
<td>ND</td>
<td>0.004</td>
<td>0.007</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.003 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-6</td>
<td>3-4</td>
<td>12/16/02</td>
<td>0.002 J</td>
<td>0.004</td>
<td>0.002</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.003 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
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<td>SB-7</td>
<td>3-4</td>
<td>12/18/02</td>
<td>ND</td>
<td>0.010</td>
<td>0.005</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.180 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-8</td>
<td>3-4</td>
<td>12/19/02</td>
<td>ND</td>
<td>0.002</td>
<td>0.016</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.003 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-9</td>
<td>2-3</td>
<td>12/20/02</td>
<td>ND</td>
<td>0.36</td>
<td>1.3</td>
<td>0.007</td>
<td>ND</td>
<td>0.071</td>
<td>0.111</td>
<td>0.000 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-10</td>
<td>3-4</td>
<td>01/07/03</td>
<td>0.007</td>
<td>0.008</td>
<td>0.003</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.008 J</td>
<td>ND</td>
<td>ND</td>
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<td>SB-11</td>
<td>3-4</td>
<td>01/08/03</td>
<td>ND</td>
<td>0.004</td>
<td>0.007</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.000 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-12</td>
<td>4-5</td>
<td>01/09/03</td>
<td>ND</td>
<td>0.003</td>
<td>0.001</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.001 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-13</td>
<td>3-4</td>
<td>01/09/03</td>
<td>ND</td>
<td>0.540</td>
<td>0.017</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.000 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SB-14</td>
<td>12-13</td>
<td>03/11/03</td>
<td>ND</td>
<td>0.066</td>
<td>0.070</td>
<td>0.043</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
<td>0.026</td>
<td>0.010</td>
<td>0.004 J</td>
</tr>
<tr>
<td>SB-15</td>
<td>10-11</td>
<td>03/12/03</td>
<td>ND</td>
<td>0.002 J</td>
<td>0.008</td>
<td>0.001 J</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>0.000 J</td>
<td>ND</td>
<td>ND</td>
<td>0.007 J</td>
</tr>
<tr>
<td>SS-1</td>
<td>1.5-3</td>
<td>12/03/02</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
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<td>0.007 J</td>
</tr>
<tr>
<td>SS-2</td>
<td>1.5-3</td>
<td>06/26/12</td>
<td>ND</td>
<td>ND</td>
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TABLE 6. GROUNDWATER ANALYTICAL RESULTS - THERMO KING, ARECIBO FACILITY, PUERTO RICO

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<th>Monitor Well</th>
<th>Vinyl Chloride</th>
<th>1,1-DCE</th>
<th>1,1-DCA</th>
<th>Benzene</th>
<th>TCE</th>
<th>Toluene</th>
<th>PCE</th>
<th>Ethyl-benzene</th>
<th>m,p-Xylene</th>
<th>o-Xylene</th>
<th>Total Xylenes</th>
<th>MTBE</th>
<th>cis-1,2-DCE</th>
<th>Carbon disulfide</th>
<th>Isopropylbenzene</th>
<th>Bromocresol</th>
<th>Cyclohexane</th>
<th>Styrene</th>
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EPA MCLs: Maximum Contaminant Level
TCA = Trichloroethane
MTBE = Methyl tert Butyl Ether
DCE = Dichloroethene
TCE = Trichloroethene
B = analyte found in laboratory blank associated with the sample
J = estimated value
E = analyte concentration exceeded instrument calibration range and was reanalyzed
ND = Not detected
Los Cidrines: Not sampled due to malfunctioning dedicated pump.
Attachment B
Screening Level Risk
Assessment
**Environmental Resources Management**

RISK ASSESSMENT
THERMOKING DE PUERTO RICO, INC.
ARECIBO, GUATEMALA

### APPENDIX

#### RISK ASSESSMENT

**THERMOKING DE PUERTO RICO, INC.**

**ARECIBO, GUATEMALA**

---

**LEGEND**

- MONITORING WELL
- SITE
- RECEPTOR
- ESTIMATED GROUNDWATER FLOW
- SUPPLY WATER WELL

---

**SITE**

**RECEPTOR**

**MONITORING WELL**

**ESTIMATED GROUNDWATER FLOW**

**SUPPLY WATER WELL**

---

**Depth to water-bearing unit:** 8.75 meters (perched zone)

**Depth to top of affected soil:** N/A

**Depth to base of affected soil:** N/A

**Length of affected soil parallel to assumed GW flow direction:** N/A

**Rainfall infiltration:** 130 cm/yr

**GW plume width at source:** 9 meters

**Saturated thickness:** 3.5 meters

**Plume width at GW/SW discharge:** 145 meters

**Plume thickness at GW/SW discharge:** 0.70 meter

---

**RECEPTOR**

- **Structure 1 Main Building Air** On-site East
- **Structure 2 Coil Building Air** 70 m North
- **Structure 3 Bakery Air** 185 m Northeast
- **Surface water Creek Water** 1,525 m West

---

**Table: Receptor Details**

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<tr>
<th>Receptor</th>
<th>Type</th>
<th>Exposure Type</th>
<th>Distance</th>
<th>Direction</th>
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<td>Structure 1</td>
<td>Main Building</td>
<td>Air</td>
<td>On-site</td>
<td>East</td>
</tr>
<tr>
<td>Structure 2</td>
<td>Coil Building</td>
<td>Air</td>
<td>70 m</td>
<td>North</td>
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<td>Structure 3</td>
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<tr>
<td>Surface water</td>
<td>Creek</td>
<td>Water</td>
<td>1,525 m</td>
<td>West</td>
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**Site Map**

- **Structure 1** Main Building
- **Structure 2** Coil Building
- **Structure 3** Bakery
- **Surface water Creek**
- **MONITORING WELL**
- **ESTIMATED GROUNDWATER FLOW**
- **SUPPLY WATER WELL**

---

**Environmental Resources Management**

RISK ASSESSMENT
THERMOKING DE PUERTO RICO, INC.
ARECIBO, GUATEMALA

---

**APPENDIX**
Attachment B

Water Supply Well Survey
## TABLE 2. WELL SURVEY FIELD CONFIRMATION RESULTS

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<th>MAP ID</th>
<th>Site Number</th>
<th>Site Name</th>
<th>Lat</th>
<th>Long</th>
<th>Notes</th>
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<td>6</td>
<td>182726066444600</td>
<td>PENIZA WELL, ARECIBO, PR</td>
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<td>66°44'46&quot;</td>
<td>No evidence of well.</td>
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<td>182733066443800</td>
<td>LOCK HUDSON WELL, ARECIBO, PR</td>
<td>18°27'33&quot;</td>
<td>66°44'38&quot;</td>
<td>No evidence of well. Site occupied by a driver training area (since 2003). Prior use - vacant land.</td>
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<td>10</td>
<td>182739066443200</td>
<td>CARIBE GE WELL, ARECIBO, PR</td>
<td>18°27'38.6&quot;</td>
<td>66°44'32.5&quot;</td>
<td>No evidence of well. Site occupied by GE Puerto rico (earliest reference - 1993)</td>
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<td>182758066451000</td>
<td>BARRANCA WELL, ARECIBO, PR</td>
<td>18°27'58&quot;</td>
<td>66°45'10&quot;</td>
<td>No evidence of well. Vacant property, former use as construction yard</td>
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<td>HERMANOS COLON WELL, ARECIBO, PR</td>
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<td>HATO ABAJO 3 WELL, ARECIBO, PR</td>
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<td>No evidence of well. Site occupied by a basketball court/baseball field (earliest ref - 1993)</td>
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<td>P.R. DISTILLING 1 WELL, ARECIBO, PR</td>
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<td>66°44'15&quot;</td>
<td>No evidence of well. Site occupied by a basketball court/baseball field (earliest ref - 1993)</td>
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<td>22</td>
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<tr>
<td>27</td>
<td>182832066441700</td>
<td>McGUINESS AR-110 WELL, ARECIBO, PR</td>
<td>18°28'32&quot;</td>
<td>66°44'17&quot;</td>
<td>No evidence of well. Site occupied by a basketball court/baseball field (earliest ref - 1993)</td>
</tr>
<tr>
<td>31</td>
<td>NA</td>
<td>LOS CIDRINES WELL</td>
<td>18°27'33.7&quot;</td>
<td>66°44'41.9&quot;</td>
<td>Out of service. Data from 2001-09.</td>
</tr>
</tbody>
</table>

**NOTES:**

See Figure C-1 for survey area and well locations.
NOTE: THE CURRENT STATUS AND/OR EXISTENCE OF THE WELLS LOCATED OUTSIDE OF THE SURVEY AREA HAVE NOT BEEN CONFIRMED.

ALJIBE (WELL)
WELL – OUT OF SERVICE
SURVEY AREA

USGS NWIS WELL INSIDE SURVEY AREA
USGS NWIS WELL OUTSIDE SURVEY AREA

IDENTIFIED GROUND WATER FLOW SYSTEM

C-1
LAND USE AND POTENTIAL SENSITIVE RECEPTORS – 1-MILE

TERMO KING DE PUERTO RICO HATO ABAJO, ARECIBO, PUERTO RICO

FIGURE C-1
Well #17 area – Looking south. Lat: 18°28'00.9"N Long: 66°44'27.5"W. University athletic track.

Well #17 area – Looking south. Lat: 18°28'00.9"N Long: 66°44'27.5"W. University athletic track.

Well #17 area – Looking south. Lat: 18°28'00.9"N Long: 66°44'27.5"W. University athletic track.

Well #17 area – Looking south. Lat: 18°28'00.9"N Long: 66°44'27.5"W. University athletic track.
Wells #20-25 and 27 area – Looking north, Lat: 18º28'11.1"N Long: 66º43'57.3"W
Basketball court

Wells #20-25 and 27 area – Looking northeast, Lat: 18º28'11.1"N Long: 66º43'57.3"W. Basketball court

Wells #20-25 and 27 area – Looking east, Lat: 18º28'11.1"N Long: 66º43'57.3"W. Former baseball field beyond trees.

Wells #20-25 and 27 area – Looking south, Lat: 18º28'11.1"N Long: 66º43'57.3"W. Former baseball field beyond trees.
Well #10 area – Looking north, Lat: 18º27'29.7"N Long: 66º44'29.6"W

Well #8 area – Looking south, Lat: 18º27'25.5"N Long: 66º44'36.5"W

Well #8 area – Looking north, Lat: 18º27'25.5"N Long: 66º44'36.5"W

Well #8 area – Looking north, Lat: 18º27'25.5"N Long: 66º44'36.5"W
Note: The area where well #14 is located was not accessible, it is a gated and secure property.

Historical Aerial Photos are Provided on the Following Pages
FIGURE
Environmental Resources Management
AERIAL PHOTO – 10/1993
USGS WELL 8 LOCATION
THERMO KING DE PUERTO RICO
HATO ABAJO, ARECIBO, PUERTO RICO

N
60 METERS
AERIAL PHOTO – 06/2009
USGS WELL 8 LOCATION
THERMO KING DE PUERTO RICO
HATO ABAJO, ARECIBO, PUERTO RICO
FIGURE
Environmental Resources Management
AERIAL PHOTO – 06/2009
USGS WELL 17 LOCATION
THERMO KING DE PUERTO RICO
HATO ABAJO, ARECIBO, PUERTO RICO