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: **Caribe General Electric Distribution Transformers, Inc.**

Facility Address: intersection of Rd 200 and Rd 201, Vieques, Puerto Rico

Facility EPA ID #: PRD000692582

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

GE Vieques LLC Caribe General Electric Distribution Transformer Inc. (Caribe GE) is an approximately 4-acre facility involved in the manufacture of power fuses, auxiliary relays, and switch gear accessories. The facility is located near the north coast of Vieques at the intersection of Road 200 and Road 201 in the Barrio Martino section of the Isabel Segunda Ward. GE started manufacturing in 1969. The property is owned by the Puerto Rico Industrial Development Corporation (PRIDCO) and leased by General Electric (2). GE is currently performing a corrective study investigation to determine what corrective action to implement at the facility. The investigation and subsequent actions are performed under a voluntary program.

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

In October 1980, the facility submitted a RCRA Part A Hazardous Waste permit application to EPA. The facility was subsequently given interim status approval as a Treatment, Storage and Disposal facility. In July 24, 1984 the facility requested a change of status to generator (3). The Puerto Rico Environmental Board (EQB) prepared a RCRA Facility Assessment (RFA) report, dated September 30, 1988, and submitted it to EPA for review. After review, EPA accepted the report on April 1, 1991 (4). The facility submitted a Part B Call-In letter on April 21, 1987 (3) to inform EPA that GE Caribe will not continue with the permit application.

At the time of the RFA, the facility was generating degreasing solvents (F001), acids (D002) and rinse waters (D003). EQB identified four (4) solid waste management units (SWMUs) and three (3) areas of concern (AOC). The SWMUs and AOC are:

SWMUs	AOC
SWMU-1 – Hazardous waste container area	AOC-1 – Raw material storage area
SWMU-2 – Leach field	AOC-2 – Degreaser tank
SWMU-3 – Concrete treatment/settling sump	AOC-3 – Electroplating area

SWMU-4 – Septic tank system	

EQB recommended no further action at SWMU-1, AOC-1, AOC-2 and AOC-3. In January 13, 2000 EQB performed an update to the RFA (5). The updated RFA did not identify additional areas.

All of the hazardous waste management units have been investigated, closure activities completed, and recommended to EPA for clean closure. In March 21, 2005, EPA issued a letter accepting the closure certification for the following units:

- Inactive subsurface leach field system (leach field – SWMU-2),
- Sediment tank (associated with the leach field) (SWMU-3),
- Septic tank system (SWMU-4), and
- Bright dip area.

EPA stated on the March 21, 2005 letter that "the Closure Certification was submitted in accordance with the amended Closure Plan which was approved on March 16, 1994; the approved Closure Report dated October 22, 2004; and in compliance with the requirements stipulated in 40 CFR § 265.115 and 265(h)." (2)

During the investigation performed for the closure of the above areas, Caribe GE found chlorinated volatile organic compounds (cVOC) in the groundwater to the south of the leach field. These cVOC were trichloroethene (TCE), 1,1-dichloroethene (1-1 DCE) and cis 1,2-dichloroethene (cis 1-2 DCE). As part of the closure certification, EPA asked Caribe GE to install additional wells and continue with groundwater monitoring. During the fall of 2005, Caribe GE installed four (4) additional wells and collected groundwater samples (6). By the end of 2005, Caribe GE had installed ten (10) wells, identified C-1 to C-10. Caribe GE monitors these wells on a semiannual basis.

In March 2007, Caribe GE performed a soil gas survey alongside its groundwater monitoring program (7). The soils gas survey was used to evaluate any potential source zones of chlorinated solvents in the unconsolidated sediments at the facility. The sampling area was located at the south of the property.

In 2008, Caribe GE submitted a Corrective Measures work plan. EPA approved the work plan, with some modifications on July 7, 2012 (8). As part of the modifications, Caribe GE installed an additional well (C-11) at the west side of the main building to determine the extent of contaminants at this area. In addition, pressure transducers were installed in all the wells to continuously log groundwater elevation.

The latest semiannual monitoring report is from December 2013. The first round of sampling for well C-11 was December 2012. Trichloroethylene concentrations at this well were 310 µg/L (9). The December 2013 round of sampling had concentrations of 63 µg/L (10). At least one additional round of sampling will be used to determine the trend of contaminants at the new well.

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)?

Media	Response	Rationale/Key Contaminants
Groundwater	YES	See below.
Air (indoors)[2]	NO	See below.
Surface Soil (e.g., <2 ft)	NO	See below.
Surface Water	NO	See below.
Sediment	NO	See below.
Subsurface Soil (e.g., >2 ft)	NO	See below.
Air (Outdoor)	NO	See below.

UNK = Unknown

☐ 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

Groundwater

Groundwater at the facility is contaminated above protective levels at four monitoring wells (C-4, C-7, C-8 and C-11). Protective levels, based on EPA Maximum Contaminant Levels, were temporarily established in a Focused Corrective Measures work plan (2). Table 1 below is a summary of the December 2013 Semiannual Report (9).

[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.

Table 1 – December 2013 Wells With Concentrations Above MCL

Parameter	MCL	C-4	C-7	C-8	C-11
1,1-Dichloroethene	7	5	**43**	4.5	**12**
cis-1,2-Dichloroethene	70	6.3	**520**	3.9	0.72
Trichloroethene	5	**44**	1.7	**37**	**63**

Concentrations are in µg/L. **Bold** values are above the MCL.
MCL = Maximum Contaminant Level (11)

Air and Soil

The facility performed a soil gas sampling event in 2007 (7). The sampling area was the southern portion of the property, adjacent to the main building. The soil gas samples were analyzed for tetrachloroethene, trichloroethene, 1,1- dichloroethane, 1,1-dichloroethene and cis 1,2-dichloroethene. The soil gas samples were collected at 32 locations on a 25ft× 30ft grid at a maximum depth of four (4) feet below ground level.

The saturated vapor concentration for tetrachloroethene and trichloroethene (dense non aqueous phase liquid) are approximately 127,000 µg/L and 417,000 µg/L, respectively. None of the soil gas samples had concentrations above the reporting limits of 68 µg/L and 54 µg/L, respectively. This data indicates that there are no source areas in the unconsolidated sediments at the sampled area. (7)

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 2 – Summary Exposure Pathway Evaluation Table For Potential Human Receptors (Under Current Conditions)

Contaminated Media	Potential Human Receptors (Under Current Conditions)						
	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	NO	NO	NO	NO	NA	NA	NA
Air (indoors)	NA	NA	NA	NA	NA	NA	NA
Surface Soil (<2 ft)	NA	NA	NA	NA	NA	NA	NA
Surface Water	NA	NA	NA	NA	NA	NA	NA
Sediment	NA	NA	NA	NA	NA	NA	NA
Subsurface Soil (>2 ft)	NA	NA	NA	NA	NA	NA	NA
Air (Outdoor)	NA	NA	NA	NA	NA	NA	NA

Instructions for Summary Exposure Pathway Evaluation Table:

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

- 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 "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

Contaminated media at the facility is groundwater. In 1995, a well survey found no domestic wells within a one-half mile radius north (downgradient) of the facility. In addition, a 1995 USGS water well survey report found no used wells within a radius of at least one mile of the facility. Public drinking water supplied to Vieques is piped from the Rio Blanco filtration plant located on the main island of Puerto Rico. A well field was operated on the south side of Vieques (in the Esperanza Valley alluvial deposits); however, operation of this well field ceased in 1978 due to saltwater intrusion. Groundwater on Vieques is not used as a potable public water supply. There are no known shallow or deep bedrock wells in the vicinity of the facility (2). Based on this the groundwater pathway is not complete.

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)?

[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 (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."

☐ 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

NA

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).

☐ 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

NA

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 *Caribe General Electric Distribution Transformers, Inc.* facility, EPA ID *#PRD000692582*, located at *Vieques, 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)**		**Date** 2014-09-23
	(print)	Jesse Avilés	
	(title)	Environmental Scientist	
Supervisor	(signature)		Date 9/23/14
	(print)	Ramón Torres	
	(title)	Branch Chief	
EPA Region or State		2	

Contact telephone and email:

Name: Jesse Avilés

Telephone: 787-977-5882

Email: aviles.jesse@epa.gov

References

1. **U. S. Environmental Protection Agency.** Environmental Indicators. [Online] September 4, 2012. http://www.epa.gov/osw/hazard/correctiveaction/eis/index.htm.

2. **Tetra Tech GEO, Inc.** Focused Corrective Measures Study Work Plan. Sterling, Virginia : s.n., August 17, 2012.

3. **Puerto Rico Environmental Quality Board.** *RCRA Facility Assessment Report Caribe General Electric Products, Inc. Vieques Plant - Vieques, P. R.* Land Pollution Control Area, Puerto Rico Environmental Quality Board. San Juan : Puerto Rico Environmental Quality Board, 1988.

4. **U.S. Environmental Protection Agency.** *RCRAInfo database.*

5. **Puerto Rico Environmental Quality Board.** *RCRA Facility Assessment Report (Up-Dated) Caribe General Electric Distribution Transformers, Inc.* Land Pollution Regulation Program, Puerto Rico Environmental Quality Board. San Juan : Puerto Rico Environmental Quality Board, 1999. p. 38.

6. **GeoTrans, Inc.** Results of Fall 2005 Field Investigation and November 2005 Groundwater Sampling Event. Sterling, Virginia : s.n., December 23, 2005.

7. —. Results of First Quarter (Q1) 2007 Groundwater Sampling Event and Soil Gas Survey. Sterling, Virginia : s.n., June 12, 2007.

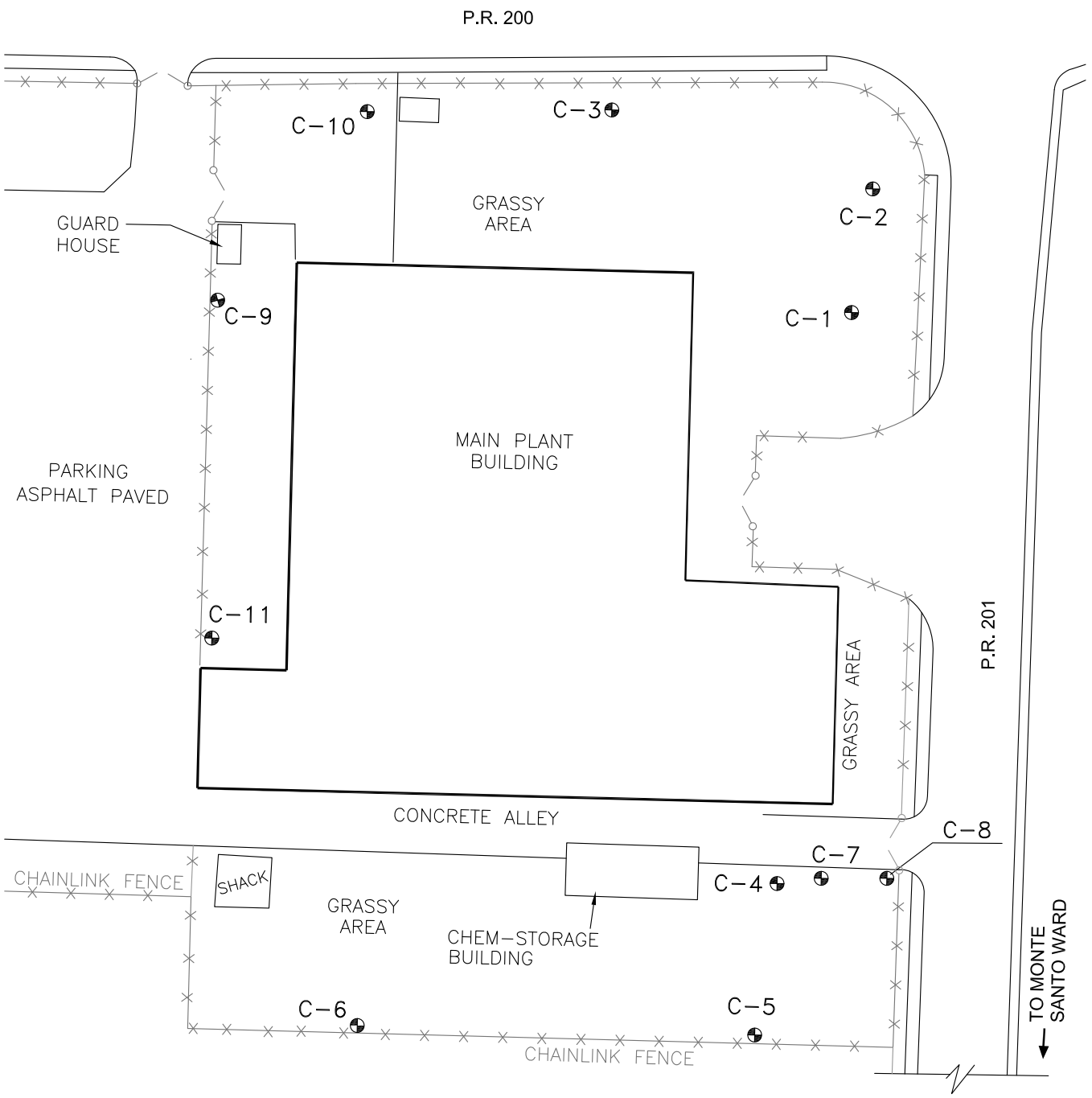
8. **U. S. Environmental Protection Agency.** 2008 Focused Corrective Measures Study Work Plan Approval. Guaynabo, Puerto Rico : s.n., July 6, 2012.

9. **TetraTech.** Results of November 2012 Field Work and December 2012 Semi-Annual Groundwater. Sterling, VA : s.n., March 15, 2013.

10. —. Results of December 2013 Field Work and Semi-Annual Groundwater Sampling Event. Sterling, VA : s.n., March 31, 2014.

11. **U. S. Environmental Protection Agency.** Drinking Water Contaminants. *U.S. Environmental Protection Agency.* [Online] June 3, 2013. [Cited: May 13, 2014.] http://water.epa.gov/drink/contaminants/.

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.



LEGEND

C-6 ● MONITORING WELL LOCATION AND DESIGNATION

N

0 60 120

SCALE IN FEET

TITLE: **SITE PLAN WITH MONITOR WELL LOCATIONS**

LOCATION: **Caribe General Electric, Vieques, Puerto Rico**

TETRA TECH

APPROVED	DB
DRAFTED	CP
PROJECT#	117-2204253
DATE	3-7-14

FIGURE 1

P:\ACAD\2204-253-VIEQ\2204253007A.DWG

Figure 2 - Site Location
Caribe General Electric Distribution Transformers, Inc.

Vieques, PR
PRD000692582

EPA United States Environmental Protection Agency

USGS Vieques Quadrangle
CEPD-RCRA-07-0039