DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Current Human Exposures Under Control

Facility Name: **Borden Resins Facility**
Facility Address: **108-112 North Main Street, Bainbridge, NY**
Facility EPA ID #: **NYD000691865**

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).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"** 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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	_X_	___	___	**-PCBs, VOCs, Phenolic Compounds, Formaldehyde**
Air (indoors)	___	_X__	___	
Surface Soil (e.g., <2 ft)	___	_X__	___	
Surface Water	___	_X__	___	
Sediment	_X__	___	___	**-PCBs, VOCs, Phenolic Compounds, Formaldehyde**
Subsurf. Soil (e.g., >2 ft)	_X__	___	___	**-PCB contaminated sediment in storm**
Air (outdoors)	___	_X__	___	**sewer and river lagoon**

_____ 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.

SITE HISTORY

The site is located in Bainbridge, New York, and was owned and operated by Borden, Inc. from the 1940s until 1981. The site is comprised of 210 acres, of which 10 acres were occupied by manufacturing facilities. During the time the facility operated, Borden manufactured synthetic resins such as phenol-formaldehyde, urea-formaldehyde, melamine-formaldehyde and polyvinyl acetate in large reactor vessels. These resins were used in the production of plywoods and fiber boards as well as molding materials for electrical parts such as telephones and circuit breakers. As a result of past waste management practices, releases of hazardous wastes and hazardous constituents have impacted soil, groundwater and sediments at the site. It is believed that oil from the Facility's Thermonal heater was the source of much of the PCB contamination. The Facility ceased operation in March 1981. Since that date, demolition of buildings and environmental activities have been pursued. In December 1997, the site was acquired by Cherokee Columbus Real Estate, LLC., (Cherokee). As part of the acquisition, Cherokee has assumed the environmental liability and is now responsible for completing the cleanup activities.

The Site is listed as an inactive hazardous waste disposal site in New York State (#709001), Classification 2, as defined under Environmental Conservation Law. This indicates potential for "significant threat to public health or environment." Among the reasons for such a classification, are the levels of PCB contamination historically detected in soils and sediments, and phenolic contamination in the groundwater.

In November 1990, Borden and the NYSDEC entered into an Order on Consent (Order) requiring investigations to completely identify environmental contamination and set forth a remedial program to address the contamination. With the acquisition of the site, Cherokee is now responsible for completing the remedial activities set forth by the Order.

RCRA INVESTIGATIONS

To determine the corrective actions necessary at the site, a series of investigations were undertaken to identify the impacts from hazardous waste or constituents. Extensive soil, sediment and groundwater investigations were conducted to evaluate all Solid Waste Management Units (SWMUs). A SWMU is an area or suspect area where

solid or hazardous wastes may have been managed or released. The purpose of these investigations was to determine the presence, nature, rate, and extent of releases of contamination at the site. Data from hundreds of soil/sediment samples and 40 groundwater monitoring wells were gathered to define the extent of any impacts and a RCRA Facility Investigation (RFI) Report was completed, summarizing this information. This information was used to help make the final recommendations for corrective measures at the site.

The following SWMUs or areas in which investigations were conducted at the site:

PCB Area;
Bone Yard;
River Lagoon;
Phenol Recovery Area;
Land Application Area;
Storm/Process Sewers;
Gasoline Underground Storage Tank:
Western Creek;
Eastern (Beatty) Creek;
Susquehanna River;
Groundwater.

SEE FIGURE 2

AREAS FOUND TO BE IMPACTED BY HAZARDOUS CONSTITUENTS
at the
FORMER BORDEN SITE

Location	Type of Contamination	Media Investigated	Media Impacted
PCB Area	PCBs/VOCs	Soil & Groundwater	Soil & Groundwater
Bone Yard	PCBs/Formaldehyde	Soil & Groundwater	Soil & Groundwater
River Lagoon	PCBs	Soil & Groundwater	Soil & Sediment
Land Application Area	PCBs	Soil & Groundwater	Soil
Phenol Recovery Area	Phenols, Formaldehyde and VOCs {primarily toluene and other tentatively identified compounds}	Soil & Groundwater	Soil & Groundwater
Storm/Process Sewers	PCBs	Sediment & Water	Sediment

Historical Maximum Concentrations of Key Contaminants

	Soil/Sediment	Surface Water	Groundwater
PCBs	14,800 ppm	N/A	9.76 ug/l
VOCs (Toluene)	1,700 ppm	N/A	330,000 ug/l
Phenolic Compounds	"	N/A	115,110 ug/l
Formaldehyde	"	4 ug/l	4,425 ug/l

REMEDIAL ACTIVITIES

Soil and Sediments

In accordance with the approved Corrective Measures Implementation Plan, all known major source areas contaminated soils and sediment have been removed through excavation or sewer clean-out. Soil and sediment clean-up was completed in accordance with the following remedial criteria:

PCB-contaminated soils and sediments

One part per million (ppm) or less PCBs was the criterion for soils in the River Lagoon and other locations of the site for unrestricted-use. This criterion was met at all off-site locations.

Twenty-five ppm or less PCBs was the criterion for restricted-use at certain on-site locations. Deed notification and restrictions will be in affect. Areas where PCBs remain at these concentrations are isolated pockets in the Bone Yard and Land Application Areas. All other on-site area have met the one ppm or less criteria.

Phenolic/VOC-contaminated soils

All unsaturated soil was removed in the immediate vicinity of monitoring well MW-29 and the former phenol recovery unit, including all grossly contaminated soil. Grossly contaminated soil was determined by visual indications of contamination (e.g., staining) and by screening of soil sample headspace.

Groundwater

An interim groundwater pump and treatment system is currently operating to address the existing groundwater plume. An in-situ bio-sparge system is currently undergoing pilot testing to determine its effectiveness as a final measures to address the remaining on-site groundwater plume. If successful, a permanent bio-sparge system will be installed in the Phenol Recovery Area. Remedial criteria for key contaminants in groundwater are as follows:

Total phenols	**1.0 ug/l**
Toluene	**5.0 ug/l**
Formaldehyde	**50.0 ug/l**
PCBs	**0.1 ug/l**

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)						
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food
Groundwater	No	No	No	No	No	No	No
Air (indoors)	No	No	No	No	No	No	No
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
Air (outdoors)	No	No	No	No	No	No	No

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):

Potential Groundwater Receptors

Two residential properties located down-gradient of the facility have groundwater supply wells used as a drinking water sources. Four quarters of routine monitoring of these private wells have confirmed that site constituents have not impacted the groundwater in these wells. SEE ATTACHMENT 1 for data summary. **At the encouragement of both the New York State Department of Health and Department of Environmental Conservation, the facility owner offered to hook-up to these residences to the public water system free of charge. Both property owners declined. Routine monitoring of the groundwater monitoring system will continue.**

Potential Subsurface Soil Exposure

Possible exposure could be to workers excavating at certain on-site locations to depths greater than two feet, since PCBs remain at some on-site locations at concentrations less than twenty-five ppm. However, mandated notification and deed restrictions are in effect to specify restricted use in these areas.

Potential Surface Water Exposure

Beatty Creek, a small tributary to the Susquehanna River, is a potential receptor for contaminated groundwater in the vicinity of the phenol recovery area. The creek flows off-site beneath Route 7, then bounds farm property and residential areas before discharging into the Susquehanna. Although exposure to this surface water is possible, data from sampling Beatty Creek s how that levels for all constituents of concern are non-detect, with the exception of formaldehyde, which was detected at 4 ppb. The Part 5 drinking water standard for formaldehyde is 50 ppb. (SEE ATTACHMENT 2). Any exposures to contaminated surface water are not expected to be significant. Although there were some low levels of constituents found in stream sediments, all surface water sampling results taken (in Western Creek, Eastern Creek and the Susquehanna River) were below action levels or non-detectable for PCBs, VOCs, Phenols and Formaldehyde.

Potential Indoor Air Exposure

There are no potential receptors for contaminated indoor air, since there are not any occupied buildings located over contaminated media. Any plans for future site development must consider the potential for indoor air exposure in any newly constructed buildings.

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)?

   ___ If 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."

   ___ 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):

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 <u>and</u> referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment). (For groundwater and soil pathways

   _____ 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 (CA 725), 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 Former **BORDEN RESINS FACILITY,** 108-112 North Main Street, Bainbridge, Chenango County, New York., **USEPA ID No.: NYD000691865**, 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 ___9/20/01
(print) Timothy I. DiGiulio, P.E.
(title) Environmental Engineering

Supervisor (signature) _____ Date ___9/20/01
(print) Paul J. Merges, Ph.D.
(title) Director, Bureau of Radiation & Hazardous Site Management
(EPA Region or State) NYSDEC

References:

Order on Consent, Index #A7-0121-87-09, *November 1990 signed by New York State Department Environmental Conservation and Borden, Inc.* The Order required Borden to identify and remediate (now Cherokee's responsibility) both on-site and off-site environmental contamination resulting from past operations and waste management practices.

RCRA Facility Investigation Report*, August 1992, prepared by T.M. Gates, Inc.* This report includes sampling results from the first RCRA investigation at the site. The NYSDEC required additional sampling to be conducted to better characterize the extent of contamination.

Phase II RCRA Facility Investigation Report*, August 1996, prepared by T.M. Gates, Inc.* This report includes the results of the additional sampling. This sampling event better characterized the extent of contamination and revealed contamination in storm sewers.

Corrective Measures Study (CMS) Report, *February 1997, revised April 1998 prepared by T.M. Gates, Inc.* This report evaluates options for Final Corrective Measures. Based on the evaluation, a recommendation for the Final Remedy was chosen.

Draft Corrective Measures Implementation Plan (CMIP), *August 1998, prepared by T.M. Gates, Inc. in conjunction with the New York State Department Environmental Conservation.* The purpose of this document is to present specifications for implementation of corrective measures addressing environmental contamination at the former Borden Resin Facility. These requirements include remedial goals and criteria; institutional controls; detailed design, construction, operation, and monitoring plans; and reporting.

Statement of Basis - Former Borden Resins Facility, Bainbridge, NY, New York State Department of Environmental Conservation, November 19, 1998. This Report summarizes the results of the investigations and studies and describes the proposed Final Corrective Measures at the site.

Certification of Completion: Final Corrective Measures Addressing Soil and Sewer Contamination, Northern Kentucky University, September 2001. This report includes all verification sampling to show the remedial criteria for the Final Corrective Measures at the site was accomplished.

Semi-Annual Groundwater Monitoring and IRM Reports, prepared by Northern Kentucky University - Environmental Resource Management Center, various dates. These reports include routine groundwater and surface water sampling results.

Locations where References may be found:

NYSDEC
Division of Solid and Hazardous Materials
50 Wolf Road
Albany NY 12233-7252

NYSDEC, Region 7
615 Erie Boulevard West
Syracuse, NY 13204-2400

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.