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: **Former Howe Furniture Facility**
Facility Address: **151 Woodward Avenue, Norwalk, CT 06856**
Facility EPA ID #: **CTD001162858**

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).

SITE BACKGROUND

The approximately 7 acre site includes a single story concrete block building with a total foot print of approximately 117,000 square feet. The site is bordered to the north by the S.B.J. Moving Company, to the south by a town recreational park, numerous residential homes are located across Woodward Ave to the east, and Aztec Inc. borders the site to the west. Pavement extends westward from Woodward Ave and wraps around the site to the southern side of the building. Norwalk harbor is located approximately 0.25 miles to the east-northeast of the site.

City records indicate the site was undeveloped from at least 1923 until 1961. Howe Folding Furniture began operations at the site in 1962 and operated until approximately 1995. The original structure was periodically improved with additions starting in 1970. The property is serviced by municipal water and sewer, and is heated with gas. Four pad mounted transformers are located outside the west and north sides of the building. Five storm drains are located around the exterior of the site which are connected to the municipal storm sewer line.

Howe was a manufacturer of tables, desks, and study carrels comprised of wood and metal parts. Howe conducted machining, dry grinding, welding, anti rust dipping, painting, metal parts cleaning, electrostatic spray painting, metal stamping and bonding, glue application, vapor degreasing, and silver soldering. Hazardous materials included various solvents, lacquers, thinners, and cadmium solder waste.

Currently, the building is divided into three sections. The northern section currently houses Cober Electronic Mfg., a manufacturer of industrial microwave heat sources for vulcanizing rubber and for commercial cooking applications. The central section is occupied by the US Post Office. The western portion of the building is occupied by Pepperidge Farm, which uses the building as a dry food storage warehouse.

At least two USTs were historically present on site. One UST located in AOCs 1 and 12 was apparently removed in 1988. In 1995, 1,215 tons of petroleum contaminated soil was removed from this area. A second UST was historically located on the southern side of the structure. This UST was apparently installed in 1977, and removed in 1987.

Groundwater beneath and in the vicinity of the site is classified as GA. According to the 1982 Atlas of Public Water Supplies, no water supply wells are located within a one mile square radius of the site. Site topography is nearly level. Groundwater flow direction may be cyclic and coincident with daily tidal fluctuations. During high tide, groundwater may flow west, while at low tide, flow may be east. The Phase II investigation of AOCs 1 and 12 indicated flow was to the west toward the adjacent wetlands.

TRC performed a Preliminary Assessment-Plus (P.A. Plus) Final Report for the Site in 1992. TRC identified 12 AOCs in the building. All of the AOCs were related to Howe's historic on-site manufacturing processes and waste materials handling and disposal.

A Phase II Subsurface Investigation Report, dated September 1995, was prepared for the work performed in AOCs 1 and 12, including the installation of monitoring wells and the collection and analysis of soil and groundwater samples. TCE in groundwater and TPH in soils were detected above CT RSR criteria.

A Phase III Subsurface Investigation Report, dated November 22, 1995, details the performance of 10 soil borings in AOCs 1 and 12. Four of eighteen samples had TPH concentrations over the CT DEP RSR Pollutant Mobility Criteria (PMC) for GA areas.

A June 1996 report titled "Summary of Investigations/Removal Activities Performed Inside the Howe Furniture Corp. Facility" describes work performed including the collection and analysis of soil and/or concrete samples from AOCs 2, 5, 6, 7, 8, 9, 10, and 11. Soil samples were collected from under the cracked concrete slab. Some metals were detected in soils above the GA PMC.

On December 21, 1995 and February 1, 1996, HRP performed soil excavations and soil sampling around a sub-slab concrete encased waste pipe located between AOCs 5 and 6. Confirmatory sampling showed concentrations of SPLP metals generally below CT RSR PMC, except for cadmium in AOC 5

On June 14, 1996, HRP issued a letter report regarding soil remediation in AOCs 1 and 12. A total of 1,215.6 tons of petroleum contaminated soil were removed from AOCs 1 and 12.

On June 1, 1998, Howe submitted the Phase I Environmental Site Assessment Report for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT. This report summarized existing historical information for the site.

On May 27, 1999, Howe submitted the "Phase II Subsurface Investigation at the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT". This report detailed an extensive subsurface investigation at the site including a soil gas survey, the performance of test borings and installation of monitoring wells, and collection and analysis of soil and groundwater samples. Results of this investigation were as follows:

Soil Gas. Forty five shallow soil gas points were installed at various sub slab locations, based on historical knowledge of solvent storage areas, hazardous waste storage areas, and along the historical southern exterior edge of the building before additions were added in the 1970's. Soil gas samples were analyzed in the field using a gas chromatograph. Minor concentrations of toluene, 1,1,1-TCA, xylenes, PCE, 1,2 DCA, ethylbenzene, and TCE were detected in the soil gas samples. All measured soil gas concentrations were orders of magnitude below the most conservative RSR standard for soil gas; the RES VC.

Test borings/wells. Twenty test borings were performed using direct push methods. In 15 borings, a 3/4 inch PVC monitoring well was installed. Soils were sampled every 2 feet using a split spoon sampler. Twenty soil samples were selected, based on PID readings, for laboratory analysis. The samples were analyzed for VOCs, TPH, and 8 RCRA metals. In addition, 8 samples were analyzed for SPLP. Two soil samples contained TPH at concentrations of 581 ppm and 1,044 ppm, which is below the IC DEC of 2,500 ppm for TPH. One sample contained arsenic at a concentration of 10.1 ppm, which exceeds the IC DEC of 10 ppm. However, the sample was collected from under the building slab, and so is environmentally isolated.

Groundwater. The measured depth to groundwater on site ranged from less than 3 feet to approximately 14 feet below grade. Groundwater flow was determined to be to the west-northwest. Groundwater samples were analyzed for TPH, VOCs and 8 RCRA metals (dissolved). Results were that TCE was observed in wells MW-10 and MW-11 at concentrations of 11 ppb and 6 ppb, above the GA GWPC criteria of 5 ppb. In addition, 1,1 DCE was observed in MW-7 and MW-8 at concentrations of 1 ppb and 2 ppb. These are below the industrial commercial VC of 6 ppb. Vinyl Chloride was detected in MW-13 at a concentration of 2 ppb. This equals the IC VC standard of 2 ppb.

SUMMARY OF AOCs

AOC 1 and AOC 12: Former #2 Fuel Oil UST and Former Drum Storage Area. Both AOCs are located in the same general location west of the building. The UST was installed in 1977 and removed in 1988. Howe removed 1,215.60 tons of contaminated soil in 1995. Groundwater samples collected from this area contained low levels of several chlorinated solvents. Howe has proposed to further investigate this area in the July 2001 RFI Work Plan currently under EPA review.

AOC 2: Ignitable Materials Storage. A soil sample collected beneath the outside hood vent on the north side of the building contained 4,000 ppm TPH, which exceeds the IC DEC of 2,500 ppm. Concrete chip samples contained detectable levels of solvents below RSR criteria.

AOC3: Hazardous Waste Container Storage Area. This area is subject to RCRA Closure requirements for > 90 day storage. Howe Furniture has not yet received CT DEP comments on Closure Plan, submitted in 1994. Metals have been detected in soils below RSR criteria. Howe has proposed to further investigate this area in the July 2001 RFI Work Plan which is currently under EPA review.

AOC4: Compressed Gas Storage Area. This area was used to store cylinders of gas, and it is considered unlikely that potential releases of the gases stored (argon, oxygen, and liquid petroleum/propane) would have penetrated the concrete floor and negatively impacted underlying soils and/or groundwater . No investigations have been performed here to date.

AOC5: Descaling Rinse Tanks. The rinse tanks were open vats outfitted with a floor drain and underground piping. Metals in soils beneath the descaling rinse tanks exceeded GA PMC criteria for cadmium and nickel. Approximately three 55 gallon drums of soil and concrete were excavated and removed from this area. The piping trench between the solder cooling water tank area and the descaling rinse tanks which connects AOC 5 and AOC 6 may have metals contamination. Howe has proposed to further investigate this area in the July 2001 RFI Work Plan which is currently under EPA review.

AOC6: Solder Cooling Water Tanks. Underground piping was located beneath the concrete floor. Soil samples from beneath the tanks exceeded RSR criteria for arsenic and cadmium. Howe has proposed to further investigate this area in the July 2001 RFI Work Plan which is currently under EPA review.

AOC7: Vapor Degreaser. A vapor degreaser (1,1,1 TCA) was replaced with an aqueous degreasing operation in May 1992. Sampling of concrete chips and one soil sample did not detect significant problems, although metals were detected in soils below the vapor degreaser at levels exceeding the GA PMC criteria.

AOC8: Pre-Powder Cleaning Line. This AOC included a steel phosphating line for stainless steel and zinc parts prior to powder coating. Two concrete chips were sampled. Soil samples were analyzed for metals, TPH, SPLP metals, and VOCs. No significant problems were detected.

AOC9: Powder Overspray Collection. One concrete chip was sampled for metals. Metals were detected in soil samples from below the dust/powder overspray area at levels below RSR criteria. No VOCs, TPH, or leachable metals were detected.

AOC10: Powder Curing Oven. Two concrete chip and one soil sample were analyzed for metals. Metals detected in soils by mass analysis and SPLP did not exceed RSR criteria. No VOCs or TPH were detected. TCLP results for cadmium and zinc for GA PMC were exceeded.

AOC11: Paint/Stain Spray Hoods. Two concrete chip and one soil sample were analyzed for metals. Metals detected by mass analysis and SPLP in soils did not exceed RSRs. No VOCs or TPH were detected.

AOC13: TPH impacted soils exterior of the carpenter room (MW-11) and assembly room (TB-6). Soils at MW-11 exceeded RSR criteria.

Wetlands. Surficial soils located in the adjacent wetlands contained SPLP for lead, and TPH. The SPLP lead was detected at a concentration equal to the RSR criteria. The TPH was detected below the RSR criteria.

BASIS FOR CA 725 ENVIRONMENTAL INDICATOR DETERMINATION

EPA reviewed applicable soil, groundwater, soil gas, and concrete chip data for each AOC. The soil data was compared to the CT RSR Industrial/Commercial Direct Exposure Criteria (I/C DEC). CT RSR Pollutant Mobility Criteria was not used for the CA 725 Determination. Groundwater data was compared to CT RSR GA Groundwater Protection Criteria (GWPC) and Industrial/Commercial Volatilization Criteria (I/C VC).

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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	_X_	___	___	TCE slightly exceeds GA GWPC
Air (indoors)[2]	___	_X_	___	Soil gas and groundwater information do not suggest a problem with indoor air
Surface Soil (e.g., <2 ft)	_X_	___	___	AOC 2 TPH (4,000 ppm) exceeds RSR DEC
Surface Water	___	_X_	___	Surface water in wetland adjacent to the site not tested, but not reasonably suspected to be contaminated.
Sediment	___	_X_	___	Sediment in wetland adjacent to the site not above RSR criteria.
Subsurf. Soil (e.g., >2 ft)	_X_	___	___	Metals contamination below building floors in select locations.
Air (outdoors)	___	_X_	___	Outdoor air not tested but not reasonably suspected to be contaminated.

_____ 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):_____

Groundwater: Site groundwater is contaminated slightly above GA GWPC criteria. TCE has been detected at 7 ppb in B-2MW, 8 ppb in MW-11, and 11 ppb in MW-10.

Surface Soils: There are a few instances of soil contamination above the CT RSR criteria beneath the on-site building and asphalt parking areas.

Subsurface soils: There are a few instances of subsurface (>2 feet below grade) soil contamination above the CT RSR criteria beneath the on-site building and asphalt parking areas.

Surface water: There are no surface water bodies on the site. There are wetlands which border the site to the west. No groundwater samples were found to contain any contaminants at levels above the CT Surface Water Protection Criteria.

Sediment: There are no surface water bodies/sediments on site. There are wetlands which border the site to the west. No sediment samples were found to contain any contaminants at levels above the RSR criteria for soils.

Indoor air: Soil gas sampling did not detect elevated levels of contaminants. Concentrations of VOCs in groundwater are below RSR VC criteria. Concentrations of VOCs in soils were below soil volatilization criteria. The building slab has been sealed with epoxy.

Outdoor Air: There is no reason to reasonably suspect significant concentrations of contaminants in outdoor air.

References:

1. January 11, 2001 EI Determination for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
3. June 1, 1998 Phase I Environmental Site Assessment Report for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
4. May 27, 1999 Phase II Subsurface Investigation at the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
5. March 9, 1998 Environmental Condition Assessment Form for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
6. July 2001 RFI Work Plan, Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT., Volumes 1 and 2.

Footnotes:

[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) suggest 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.

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[3]
Groundwater	_No	_No	No_	Yes	No	No	No
~~Air (indoors)~~	_No	_No	No_	No	No	No	No
Soil (surface, e.g., <2 ft)	_No	_No	No_	Yes	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	Yes	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.

_____ 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).

__X__ 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) The only receptors reasonably expected to be exposed to contaminated media at the site are construction workers. Regular site workers are not exposed to groundwater or subsurface soils. All contaminated surficial soils are located below pavement and thus workers are not likely to be exposed to them.

Groundwater: Concentrations in groundwater are slightly above GA GWPC criteria (for drinking). Although the area is classified as GA, the site exists on a peninsula adjacent to Norwalk Harbor, and as such, the area is not suitable for water resource development. The area is serviced by a municipal water supply, and there are no known public or private drinking water wells in the area. Onsite groundwater flow is generally toward the west-northwest in the direction of the adjacent wetlands and away from residential areas.

Surficial Soils: All known exceedences were detected beneath the building or site asphalt and as such are not accessible to site workers.

Subsurface Soils: All known exceedences were detected beneath the building or site asphalt and as such are not accessible to site workers.

[3] 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"**[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)?

__X__ 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):

The concentrations of contaminants detected in groundwater only slightly exceed drinking water standards, and thus are unlikely to pose a significant threat to construction workers. Likewise, the exceedences of the RSR criteria for surficial soils and subsurface soils are only moderately above the RSR critiera which is protective of site workers, who are not typically exposed to these soils since they are below slabs and pavement. Construction workers are typically exposed to subslab soils for a shorter duration and are thus not likely to have significantly exposures.

[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.

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 Former Howe Furniture Facility, EPA ID # CTD001162858, located at 151 Woodward Ave, Norwalk, CT 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) Robert W. Brackett Date 9/18/01
(print) Robert W. Brackett
(title) RCRA Facility Manager

Supervisor (signature) [signature] Date 3/4/02
(print) Matthew R. Hoagland
(title) RCRA Corrective Action Section Chief.
(EPA Region or State) EPA New England, Region I

References:

1. January 11, 2001 EI Determination for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
2. June 1, 1998 Phase I Environmental Site Assessment Report for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
3. May 27, 1999 Phase II Subsurface Investigation at the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
4. March 9, 1998 Environmental Condition Assessment Form for the Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT.
5. July 2001 RFI Work Plan, Former Howe Furniture Facility, 151 Woodward Ave, Norwalk, CT., Volumes 1 and 2.

Locations where References may be found:

The reports listed above are located in the site file.

Contact telephone and e-mail numbers

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