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RCRA RECORDS CENTER
FACILITY North & Judd
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DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)**

Migration of Contaminated Groundwater Under Control

Facility Name: North & Judd
Facility Address: 699 Middle St., Middletown, CT
Facility EPA ID #: CTD 051 320 372

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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?

- If yes - check here and continue with #2 below.
- If no - re-evaluate existing data, or
- if data are not available, skip to #8 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

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).

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)
Page 2

2. Is groundwater known or reasonably suspected to be “contaminated”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The State of Connecticut Department of Environmental Protection (CTDEP) is the lead for this site. The site is currently subject to Connecticut’s closure and property transfer programs. In addition, because the site is a land disposal facility, the site will soon also be subject to Connecticut’s Corrective Action program.

There are some 18 Areas of Concern (AOC) at the site. An AOC summary table is provided in **Attachment A**. According to CTDEP, releases to the environment were documented at eight locations: AOC’s 1, 3, 6, 10, 16, 16b, 17 and 18. A program for post-remedial groundwater monitoring for each of these locations is specified in a CTDEP December 24, 2003 letter. Interim Actions (IA) have been conducted at many of the AOCs, including among others, AOC’s 4, 5, 6, 9, 12, 13, 14 and 17. Two AOCs, 3 and 16, are currently or have previously undergone closure activities. In an August 4, 1998 letter, CTDEP approved as complete the investigation and remediation of AOCs-1,2 & 14. In addition, based on the available information, it is possible to reasonably conclude that a few of the AOCs have few outstanding issues or require limited follow-up (AOCs 4, 5, 7, 8, 9 and 15).

On August 30, 2001, the CTDEP issued an approval letter for a June 5, 2001 N&J report and July 30, 2001 and August 24, 2001 addendum letters to that report (prepared by SESTECH Environmental). This June 5, 2001 report and it’s addendum letters summarize the investigation and remedial activities undertaken at the facility and conclude that remedial measures required have been completed except for the groundwater monitoring requirements and the filing of environmental land use restrictions. In addition, by this Aug. 30, 2001 approval letter, CTDEP summarily approved as complete AOC’s 5, 7, 8, 9, 11, 12, 13 & 15. CTDEP approval and correspondence letters and the SESTECH addendum letters are provided in **Attachment B**.¹

An itemized status for each of the AOCs that have either contributed to groundwater contamination or could potentially impact groundwater is provided below.

- **AOC-1** is the Lacquer and Paint Storage Area. According to CTDEP, heavy metals are present in soil beneath the slab. This contamination will be addressed through the filing of an environmental land use restriction (ELUR) where the soil will be classified as inaccessible and environmentally isolated. The available groundwater data indicates minimal impact to groundwater from this AOC.
- **AOC 3** is a Hazardous Waste Drum Storage and Chemical Storage area (a.k.a. Rack Storage Area). The PA-Plus Report dated August 7, 1992 (**PA-Plus**) ranked this AOC as a “low release potential” area. In a draft Environmental Indicator (EI) Evaluation prepared by North & Judd (N&J) in November of 1996, N&J indicated the AOC was “currently undergoing RCRA closure in accordance with a closure plan approved by [CT]DEP in a letter dated March 19, 1996. November 1996 N&J Draft EI Evaluation at 6 (**N&J EI Evaluation**). According to CTDEP,

¹ All other reports and documents (e.g., June 5, 2001 SESTECH Environmental report) are available at the EPA record center.

chromium is present in soil beneath the slab at a concentration of 211 mg/kg. This contamination will also be addressed by the ELUR. The available groundwater data indicates minimal impact to groundwater from this AOC.

- **AOC 6** is a Scrap Metal Dumpster Area. The PA-Plus noted a sump full of a “dark liquid with an oily sheen” in the area. PA-Plus at Attachment A. However, there is some confusion with respect to this AOC: the PA-Plus links the sump with AOC 4 and N&J links this AOC with AOC 15 and the outside of the western building wall (CTDEP issued an administrative Order for this area, Order No. WC-4026, to “stop the release of oil to the wetland.” *Id.*). N&J asserted it was in “[f]ull compliance with the Order.” N&J EI Evaluation at 7.

According to CTDEP, remediation of petroleum impacted soils has been completed under a Pollution Abatement Order WC-4026. A GZA Nov 11, 1999 "Soil Excavation Report" documents that 100 tons of oil contaminated soil was removed from the Metal Chip Storage Area in 1999. The Dec. 21, 1999 GZA letter to CTDEP documents that all four sediment sampling at the storm drain outfall were below MDL. The SESTECH July 30, 2001 letter states, "[a]ll remedial activities, with the approval and direction of CTDEP, have been completed and no further action is requested pending ... groundwater monitoring." According to CTDEP, there are no longer shallow soil, sediment or surface water impacts related to AOC-6. However, additional groundwater monitoring remains to be performed for the actions required under the CTDEP Order to be completed.

- **AOC 10** is a former Tumbling and Deburring Area. Based on N&J's EI Evaluation, prior to 1990, liquids from AOC 10 were pumped via a floor trough[s] and a sump to AOC 12. After 1992, liquids were pumped to AOC 9. The floor troughs were filled with concrete in 1995. The PA-Plus ranked this AOC as a “low release potential” area. N&J assert there are no historic releases at this AOC. N&J attributes VOCs in this area to AOC 17 and concludes a moderate release potential and apparently relies on GW data from monitoring wells installed outside of the building's south wall to infer a need for Corrective Action. According to CTDEP, cadmium and chromium have been detected in soil beneath the slab adjacent to the former floor trenches. The metals beneath the floor will be addressed through the ELUR. The available groundwater data indicates minimal impact to groundwater from this AOC.
- **AOC 16** is the Former Chromating Sludge Dewatering Lagoon and Rolling Room Sludge Water Pile Area (a.k.a Lagoon and Metal Hydroxide Stockpile). The PA-Plus characterizes this AOC as “low release potential.” N&J's EI Evaluation indicates that a closure plan was approved by CTDEP and EPA on Sept 27, 1987. N&J and its consultant certified closure on Dec. 14, 1988. Under the closure plan, GW monitoring was to continue until four (4) consecutive rounds of data indicated all parameters below drinking water standards; this criteria was met and monitoring was discontinued in “198-” [probably 1989]. N&J EI Evaluation at 12. CTDEP requested a Post Closure Permit Application on Oct. 28, 1991. N&J submitted a Post Closure Equivalency Demonstration (PCED) in lieu of the permit application on Dec. 18, 1991. To date, there has been no formal response on the PCED from CTDEP or EPA. “However, [CTDEP] informally [] has advised N&J that the two inch diameter PVC pipe which was used to convey sludge from the wastewater treatment plant (AOC 9) to the lagoons will need to be addressed/closed as part of current closure requirements. N&J is currently proceeding with testing and removal of this line . . . as part of [] voluntary corrective action.” N&J EI Evaluation at 12. According to CTDEP, there is no significant remaining soil or groundwater impacts related to this area.

AOC “16b” is the piping to the AOC 16 Lagoon. According to CTDEP, in 1991, the remediation of metal hydroxide sludges with cadmium and chromium was completed at the location of a break in the pipeline to the lagoon. The available groundwater data indicates minimal impact to groundwater from this AOC.

The pipeline has been fully removed. (GZA Feb. 7, 2001 letter to CTDEP). The SESTECH July

30, 2001 letter states that soil in the area of the historic pipeline leak "had previously been excavated by both CDM and GZA" in separate events. At the request of CTDEP, two additional soil samples were taken on April 20, 2001. These samples were analyzed for hexavalent chromium, and total cadmium and chromium. All analyzed constituents were non-detected or below R-DEC standards. In response to CTDEP's question about shallow soil staining which had not been subject to sidewall sampling, the August 24, 2001 SESTECH letter noted "SESTECH resampled the NORTH-1 location on August 22, 2001. ... All analyzed constituents were non-detect or below R-DEC standards." The CTDEP subsequently approved these two documents on August 30, 2001.

- **AOC 17** is the Galvanize Area. Based on the available information, chlorinated ethenes were detected below the building floor slab near AOC 10. Contamination at MW-2 was attributed to a preferential pathway via sub-slab materials. GZA (N&J's consultant) was to investigate this migration pathway. An SVE system was designed and installed by TerraVac in 1992; this system operated until July 1994 until achievement of criteria as set forth in a contact between N&J and TerraVac (i.e., a reduction in VOC concentrations by one order of magnitude). Operation of the system, however, was completed prior to promulgation of Connecticut's Remediation Standard Regulations (RSRs). "N&J is [] completing confirmation sampling in accordance with a work plan approved by [CT]DEP by letter dated July 18, 1995 to demonstrate that the remediation is in compliance with the [RSRs]." N&J EI Evaluation at 13. At the time of the N&J EI Evaluation, this work was on-going and was to include, among other tasks, installation of additional, deep groundwater monitoring wells." The PA-Plus did not identify this AOC.

According to CTDEP, chlorinated solvents (primarily PCE) are present in the tight soils beneath the floor. A pilot test for a high vacuum venting system indicated that it was technically impracticable to remediate the soil while the building is in place. To prevent vapor migration into the building, and the lateral migration of vapors (conditions that would breach the environmentally isolated presumption of the ELUR), a venting system has been installed beneath the floor to maintain a negative pressure. The indoor air monitoring program to determine the effectiveness of the system, as specified in a CTDEP July 29, 2003 letter, has not yet been initiated. A mechanism still needs to be developed to assure the venting system will continue to be operated. In conjunction with the venting system, the residual solvent contamination will be addressed by the ELUR.

- **AOC 18** is the Polish Room / Vapor Degreaser. This AOC was not identified in the PA-Plus. Based on N&J's EI Evaluation, VOCs (primarily ethanes) were detected beneath the building floor slab. N&J "concluded that VOCs in this area were 'contained' and were not contributing to the VOCs present in groundwater noted in well GZ-2. . . . N&J has also advised CTDEP of [this matter] and will pursue remediation of this area pursuant to the [RSRs] following completion of work in the galvanizing area (AOC No. 17)." N&J EI Evaluation at 13-14. According to CTDEP, as at AOC-17, PCE is present in the tight soils beneath the floor and a negative pressure venting system will continue in long-term operation. The pilot test at AOC-17 was used to support the technical impracticability of remediation in this area as well. The indoor air monitoring program specified in the CTDEP July 29, 2003 letter has not yet been initiated. In conjunction with the venting system, the residual solvent contamination will be addressed by the ELUR.

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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 3

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination)?

If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”².

If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) - skip to #8 and enter “NO” status code, after providing an explanation.

If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Based on the available information from CTDEP, releases of metals and/or chlorinated solvents appear to be contained (metals at AOC's 1, 3 and 10 are contained under the facility building slab) or under control (see below).

According to CTDEP, chlorinated solvents have been consistently present in the bedrock monitoring well adjacent to AOC-17, with PCE and its breakdown products present in the range of 2,500 ug/l. The five bedrock monitoring wells located 400 to 600 feet down-gradient and side-gradient from that point have shown no more than 30 ug/l of total halogenated VOCs indicating that the groundwater impacts from these releases, which occurred more than 20 years ago, is limited in extent.

In addition, one monitoring well near AOC-6 exceeds standards for chromium in one of the available two rounds from that well, but the exceedences are not so significant as to warrant concern about off-site migration. These metals appear to be likely associated with either the floor trenches or the pipe leak.

Groundwater monitoring results are available for 6/00, 10/00, 12/00 and 4/01. The highest concentrations observed in groundwater are:

- Total Cr - 0.177 mg/l (0.0121 mg/l filtered) at MW-15
- Total Cr - 0.0846 filtered at MW-16
- Cd - 0.009 mg/l filtered at MW-16
- Ni - 0.112 mg/l (0.0431 mg/l filtered) at MW-15
- PCE - 2,000 ug/l - TCE 500 ug/l - cis-DCE 770 ug/l at MW-17

Based on this information, it is reasonable to conclude that the migration of contaminated groundwater has stabilized such that contaminated groundwater is expected to remain within the existing area of contaminated groundwater” as defined by the monitoring locations designated at the time of this determination.

² “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 4

4. Does "contaminated" groundwater discharge into surface water bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

not applicable

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Page 5

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):_

not applicable

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Page 6

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

not applicable

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 7

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”

If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”

If no - enter “NO” status code in #8.

If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

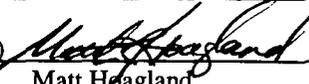
According to CTDEP, additional groundwater monitoring remains to be performed for the actions required in Pollution Abatement Order WC-4026.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 8

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

- YE** - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **North & Judd** facility, EPA ID # **CTD051320372**, located at **699 Middle St., Middletown, CT**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.
- NO** - Unacceptable migration of contaminated groundwater is observed or expected.
- IN** - More information is needed to make a determination.

Completed by	(signature) <u></u>	Date: <u>3/31/99</u>
	(print) <u>Raphael J. Cody</u>	Revised: <u>8/30/04</u>
	(title) <u>RCRA Facility Mngr.</u>	
Supervisor	(signature) <u></u>	Date <u>9/2/04</u>
	(print) <u>Matt Hoagland</u>	
	(title) <u>Chief, Corrective Action</u>	
	(EPA Region or State) <u>Region 1</u>	

Locations where References may be found:

EPA Record Center, Donna Jutras, 617.918.1455

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