

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: **Nepara**  
Facility Address: **Route 17, Arden House Road, Harriman, NY, 10926**  
Facility EPA ID #: **NYD002014595**

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).

#### **FACILITY BACKGROUND**

The Nepera, Inc. facility, a current subsidiary of Cambrex Corporation, is located at New York Route 17, in Harriman, Orange County, New York and encompasses 28.38-acres on two parcels (Reference 1). The first parcel is 9.74 acres and contains the active manufacturing facility, including the parking lot, State Pollutant Discharge Elimination System (SPDES) lagoon, and former "blind" lagoon. The second parcel, consisting of 18.64 acres, includes the plant processing areas. The facility is bound to the north-northeast by the West Branch of the Ramapo River, to the east-southeast by undeveloped land, to the west-southwest by Conrail railroad tracks, and to the northwest by New York Route 17 (Reference 3, Figure 1.2). An undeveloped, 103-acre parcel of land known as the "Avon" parcel is located south-southeast of the facility. The facility is presently zoned light industrial/commercial, with surrounding land uses being industrial to the north, and residential and undeveloped land to the west.

Industrial use of the facility began in 1942 when the Pyridium Corporation began manufacturing the chemical niacinamide. The Pyridium Corporation, and its affiliate, the former Nepera Chemical Company, continued operations at the facility from 1942 until 1956 at which time the companies were sold to the Warner-Lambert Company (WLC) and dissolved. In 1957, Nepera, Inc. was formed as a wholly-owned subsidiary of WLC. Nepera, Inc. owned and operated the plant from 1957 to 1976 at which time the company was sold to Schering AG of Germany, who in turn sold the company to the Cambrex Corporation in 1986. Bulk and fine pharmaceutical chemicals, hydrogels, and pyridine-based industrial chemical products and intermediates have been manufactured at the plant since 1942, and continue to be manufactured today. A large number of chemical raw materials, intermediates, products, and wastes have been handled at the



facility over the past 60 years (Reference 5).

Facility access is currently restricted by security fencing. Most of the facility is occupied by buildings, paved roads and walkways, parking lot, and spill prevention areas. Some unpaved areas exist in the eastern sections of the facility.

Groundwater flow at the facility within the perched water table and overburden aquifer unit is generally east-southeast toward the West Branch of the Ramapo River. The overburden aquifer is less transmissive along the downgradient side of the facility, which restricts flow through the overburden in that area. In the bedrock aquifer, groundwater flow occurs in a radially eastward direction from an area of higher water levels on the west side of the facility resulting from recharge where the overburden aquitard is locally absent (References 3 and 4).

Surface water bodies in the area include the West Branch of the Ramapo River, running along the northeast side of the facility, and an on-site SPDES-permitted lagoon to the east of the parking lot. The West Branch of the Ramapo River receives effluent from a sewage treatment plant located immediately upstream of the facility. After flowing past the facility's northeast boundary, the river curves southward. Based on facility groundwater flow modeling, the SPDES lagoon leaks to the groundwater, creating a slight mound beneath the pond and a hydraulic divide between the facility and the West Branch of the Ramapo River in the vicinity of the lagoon (Reference 20). Stormwater runoff at the facility generally flows over road surfaces in an east-northeasterly direction toward Arden House Road or the open field and the West Branch of the Ramapo River. Some of the stormwater is collected by storm drains and channeled to the SPDES lagoon, which eventually discharges to the West Branch of the Ramapo River. Stormwater that collects in containment areas, such as tank or berm areas, was previously collected and burned in the on-site incinerator (Reference 4), but is now discharged to the SPDES lagoon (Reference 33). In addition, a former intermittent drainage path ran from the southern-most corner of the facility onto the adjacent Avon parcel, which is itself poorly drained and swampy (References 3 and 4). The drainage path has since been blocked off and stormwater runoff is directed to the SPDES lagoon (Reference 33).

An off-site well survey conducted as part of the 1995 Remedial Investigation identified 19 wells in the vicinity of the facility (Reference 4, Figure 3.3). Seven of the wells were municipal supply wells and the remainder were used as private commercial or private residential supplies. Two of the wells were completed in the overburden sand and gravel, and the bedrock wells ranged in depth from 200 to 800 feet below ground surface (bgs). Four of the wells were reportedly inactive at the time of the survey, including the Mary Harriman Well No. 2 (MH-2), which was the closest well to the facility. The Mary Harriman Well No. 1 (MH-1) was a replacement well that was reportedly contaminated with chlorinated solvents believed to have originated from a facility located west of the MH wells. The Town of Woodbury is located downgradient of the facility, but no private or municipal supply wells were found in this direction in close proximity to the facility during the off-site well survey (Reference 4). According to conversations with NYSDEC, no private or municipal supply wells have been identified immediately downgradient

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### **Location**

This facility is located on NY Rout 17 in the Town of Woodbury, Orange County approximately one mile west of Exit 16 of the NY State Thruway. The southwest corner of the site is in the Town of Monroe. The facility is bound to the north-northeast by the West Branch of the Ramapo River, to the east-southeast by undeveloped land, to the west-southwest by Conrail railroad tracks, and to the northwest by New York Route 17 (Figure 1). An undeveloped, 103-acre parcel of land known as the "Avon" parcel is located south-southeast of the facility. The facility is presently zoned light industrial/commercial, with surrounding land uses being industrial to the north, and residential and undeveloped land to the west.

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2. Is **groundwater** known or reasonably suspected to be “contaminated”<sup>1</sup> 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): Groundwater monitoring data collected during the past 4 years show Exceedances of NY State Groundwater Quality Standards (part 703). The data from the 2000 and 2003 groundwater reports show a much smaller plume of contamination. At this time only VOC of concern that remains at the site is benzene, and the only SVOCs of concern that remain at this site are 2-Aminopyridine and alpha picoline.

Groundwater samples collected in November 2000 were analyzed for VOCs (BTEX and chlorobenzene) and SVOCs (pyridine, 2-amino-pyridine, and  $\alpha$ -picoline). The highest overburden concentrations were detected in the general vicinity of on-site monitoring wells MW-16 (Areas G and H) and MW-20S. Maximum concentrations were detected at on-site wells OW-6 and OW-7 (near MW-16) for benzene (20,000  $\mu\text{g/L}$  and 9,500  $\mu\text{g/L}$ , respectively) and  $\alpha$ -picoline (3,900  $\mu\text{g/L}$  and 640  $\mu\text{g/L}$ , respectively). PZ-4 is the furthest location to the northeast where the  $\alpha$ -picoline plume was detected. Benzene was detected in well MW-1, adjacent to the West Branch of the Ramapo River, at a concentration of 98  $\mu\text{g/L}$ .

The results of the 2003 Groundwater Report (results listed in Table 1) show significant improvements in the level of contamination and the size of the contaminant plumes (Figure 4)

Highest levels of Organic Contaminants found at Nepera 2003  
vs. Groundwater Standards

Compound	Facility Groundwater (ug/l)	Groundwater Standard (ug/l)
Benzene	1900	0.7
Toluene	940	5.0



Chlorobenzene	10	5.0
alpha-picoline	1100	50
2-amino-pyridine	4300	50

Bedrock wells also show some contamination but at much lower levels than the overburden, and the level of contaminants as well as the size of the plume have been reduced since the site remediation work began in 1991.

Bedrock samples were collected from wells RW-1, R-3, and MW-1 in 2000, 2001, and 2003 and analyzed for benzene as part of the monthly progress reporting. The April 2002 report presented BTEX, chlorobenzene, and pyridine data from December 2001 for wells RW-1, MW-6, MW-7, MW-20S, and MW-20D. Maximum concentrations in bedrock were detected in well MW-20D, including benzene (41 µg/L), toluene (28 µg/L), ethylbenzene (1 µg/L), total xylenes (2 µg/L), α-picoline (26 µg/L), and 2-aminopyridine (140 µg/L). Pyridine was not detected in well MW-20D in December 2001.

Footnotes:

<sup>1</sup>“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).

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

  X   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"<sup>2</sup>).

       If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"<sup>2</sup>) - 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):

**Groundwater.**

**Corrective Action:**

This site has been investigated and remediated by the Division of Environmental Remediation, and a ROD was issued in March 1997 detailing the corrective action efforts that continue to this date.

In 1991 an Interim Remedial Measure (IRM) was initiated. The IRM involved three groundwater extraction wells (MW-1 in Area C, and RW-1 and R-3 in Area F) and a granular activated carbon (GAC) treatment system. Effluent from MW-1 is now also treated by an ion-exchange system prior to discharge to the SPDES lagoon. The goal of the IRM was to hydraulically contain, capture, and treat contaminated groundwater on-site. This IRM is on-going. The contaminant plumes at these three areas have shrunk considerably and are now well within the borders of the property.

An SVE pilot test, a Vacuum-Enhanced Recovery (VER) pilot test, and a biosparging pilot test were initiated at the facility between November 2000 and January 2001 (Reference 3 and 4). The SVE and VER pilot tests were conducted near Test Pit 9 (Area A) to determine the potential effectiveness of the technologies in removing VOCs from the unsaturated zone, and in removing adsorbed VOCs and impacted groundwater from the less permeable zones, respectively. Consultants for the facility concluded that the SVE and VER technologies would have very limited effectiveness. The biosparging pilot test, however, conducted near well MW-25S (Area H), was effective in reducing contaminant mass and in turning the groundwater into an aerobic environment, conducive to biodegradation; this system was continued and expanded in this area in December 2001. In September 2002, the biosparging system was expanded to MW-1.

<sup>2</sup> "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.

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4. Does “contaminated” groundwater discharge into surface water bodies?

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

  X   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):

Currently, no groundwater or on-site surface water is able to enter non-permitted off-site surface water bodies. Surface water bodies in the area include the West Branch of the Ramapo River, running along the northeast side of the facility, and an on-site SPDES-permitted lagoon to the east of the parking lot. The West Branch of the Ramapo River receives effluent from a sewage treatment plant located immediately upstream of the facility. After flowing past the facility’s northeast boundary, the river curves southward. Based on facility groundwater flow modeling, the SPDES lagoon leaks to the groundwater, creating a slight mound beneath the pond and a hydraulic divide between the facility and the West Branch of the Ramapo River in the vicinity of the lagoon. Stormwater runoff at the facility generally flows over road surfaces in an east-northeasterly direction toward Arden House Road or the open field and the West Branch of the Ramapo River. Some of the stormwater is collected by storm drains and channeled to the SPDES lagoon, which eventually discharges to the West Branch of the Ramapo River. Stormwater that collects in containment areas, such as tank or berm areas is discharged to the SPDES lagoon (Reference 33).

Reference:

1. *Record of Decision: Nepera, Inc. – Harriman.* NYSDEC, Division of Environmental Remediation. March 1997.
2. *Feasibility Study Report, Harriman Site.* Conestoga-Rovers & Associates. September 1995.
3. *Annual Groundwater Monitoring Report 2000, Nepera, Inc., Harriman, New York.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. March 1, 2001.
4. *Groundwater Monitoring Data Tables and Figures, November 2000 Sampling Event – Harriman Site, Harriman, New York.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. March 2, 2001.



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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> 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 concentration<sup>3</sup> 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 concentration<sup>3</sup> 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 concentrations<sup>3</sup> 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): \_\_\_\_\_ SKIPPED \_\_\_\_\_  
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<sup>3</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.





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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):

Groundwater remedial work will be continuing for at least the next decade. A monitoring program which is part of the corrective action work is in place and regular reports are being submitted to the NYSDEC for review. If a problem is observed, a re-evaluation of this positive EI 750 will be initiated.

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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).


X

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 Nepara facility, EPA ID # NYD002014595, located at Route 17, Arden House Road, Harriman, NY, 10926. 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  Date: September 30, 2004  
Paul Patel  
Environmental Engineer

Supervisor  Date: September 30, 2004  
Daniel J. Evans  
Environmental Engineer 3  
(EPA Region or State)

Locations where References may be found:  9/30/04

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