



State of Ohio Environmental Protection Agency

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**Certified Mail
Return Receipt Requested**

**Re: Former NCR Facility
EPA ID #:OHD001876267
Explanation of Significant
Differences**

July 26, 2007

NCR Corporation
Attn: Mr. Roger McCready
Corporate Environmental Engineer
Global Environmental, Health & Safety-Law Department
1700 South Patterson Blvd., WHQ-3E
Dayton, Ohio 45497

Dear Mr. McCready:

Here is the Explanation of Significant Differences for the Remediation of the former NCR Facility located in Cambridge, Ohio.

The Decision Document presented the selected remedial actions for the former NCR Facility in accordance with the policies of Ohio EPA, statutes and regulations of the State of Ohio. This Explanation of Significant Differences presents a change in the selected remedies from those listed in the Document.

If you have any questions regarding the Explanation of Significant Differences, please call Jim Sferra of Ohio EPA's Southeast District Office at (740) 385-8501.

Sincerely,

David A. Sholtis, Assistant Chief
Division of Hazardous Waste Management

NCR.Explanation.Differences.doc

cc: Jim Sferra, DHWM, SEDO
Jeremy Carroll, DHWM, CO
Guernsey County District Public Library

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korteski, Director

EXPLANATION OF SIGNIFICANT DIFFERENCES

SITE NAME AND LOCATION

Former NCR Facility (OHD001876267)
800 Cochran Avenue
Cambridge, Ohio 43138

REMEDIAL DECISION

On April 27, 2006, the Director of Ohio EPA signed a Declaration and Decision Document selecting the remedies for the former NCR Facility (NCR) in Cambridge, Ohio. The remedial actions were selected pursuant to the April 1998, Director's Final Findings and Orders and in accordance with the relevant statutes and rules of the State of Ohio and the policies of Ohio EPA. This Explanation of Significant Differences presents a change in the selected remedies from those presented in the Declaration and Decision Document.

OVERVIEW OF THE FACILITY

The final RCRA Facility Investigation (RFI) Report approved by Ohio EPA in 2003 summarizes the nature and extent of impacts to soil, stream sediments, surface water and ground water. The environmental media sampled to determine the nature and extent of contamination included soils, surface water, sediment, ground water and indoor air. The investigation identified three areas where soils and ground water were impacted by chemicals associated with facility operations.

Subsequent to approval of the RCRA RFI Report, various remedies were evaluated in a Corrective Measures Study (CMS) conducted by NCR. From this study, Ohio EPA proposed remedies in a Statement of Basis and provided the opportunity for public comment on the proposed remedies. The public comment period ran from October 31, 2005, to December 19, 2005. On December 8, 2005, a public meeting was held at the Guernsey County City Council Chambers. Both NCR and the current property owner, Edgetech I.G., Inc. provided comments on the proposed remedies presented in the Statement of Basis. The Director of Ohio EPA selected the remedies through the Declaration and Decision Document he signed on April 27, 2006.

OVERVIEW OF REMEDIAL OBJECTIVES

Numerous waste management units and areas of concern were investigated at the site and the results of the investigation allowed for the conceptual grouping of the contamination into three discrete areas (see attached Decision Document). Eliminating exposure to contaminants, reducing contaminant concentrations, and monitoring potential exposures are the objectives of site remediation.

Site-wide: The facility has been an industrial facility for the better part of the last 100 years. Residential exposures do not currently exist at the site. Eliminating the potential for future residential exposures at the site is an objective for site remedy.

Area 1: Ground water is migrating off-site in Area 1. Ensuring that ground water leaving the site boundaries meets applicable standards (e.g., MCL or risk-based standards, and off-site vapor intrusion goals) is one remedial objective for this area. In addition to the first objective, direct exposure to contaminated on-site soils and ground water must be addressed.

Area 2 and Area 3: Objectives for the remediation in Areas 2 and 3 include the protection of site workers from contaminated soils, protection from vapor intrusion, and elimination of potential exposures to ground water.

SIGNIFICANT DIFFERENCES FROM THE DECISION DOCUMENT

The selected remedies in the Decision Document included: an Environmental Covenant to restrict both land use and ground water use on-site; a phytoremediation system to address ground water quality and quantity along the northeastern property boundary; a zero-valent iron treatment system to address on-site contamination; an indoor air monitoring plan to monitor air quality; and a ground water monitoring plan that would: (1) ensure that the plume of contaminated ground water does not grow or migrate, (2) ensure that the contaminants continue to degrade, (3) evaluate the effectiveness of the zero-valent iron treatment system, and, (4) ensure that the phytoremediation system is functioning effectively.

In a letter dated May 14, 2007, NCR, following consultations with Edgetech E.G. Inc., proposed altering the selected remedy for Areas 1 and 2 by (1) augmenting the zero-valent iron treatment system with an electro-osmosis system (Lasagna™); and, (2) replacing the phytoremediation system in Area 1 with a barrier wall to impede ground water flow. These are the only requested changes to the Decision Document.

NCR proposed these changes due to recent improvements and lowered installation costs of the Lasagna™ system; greater efficiency of the Lasagna™ system; agreements between NCR and Edgetech regarding site operations and placement of the Lasagna™ system; and, due to scientific discussions regarding the theoretical time frames required for the zero valent iron treatment systems to affect a remedy. Originally NCR projected 8 to 10 years for the zero-valent iron system to remediate the contamination. However, based on a re-evaluation of diffusion rates, and chemical properties, the time frame estimates ranged from 8 to 10 years, to greater than 100 years, depending on the diffusion rates,

chemical properties, and equations used for the estimate. However, Ohio EPA believes that the zero valent iron treatment system is an important component of the remediation strategy and desires to use it to augment the Lasagna™ System where that remedial strategy is impractical. The areas where the zero-valent iron system will be used will be monitored, evaluated, and the remedy adjusted as necessary. An advantage of the implementation of the Lasagna™ System is that co-use of material and equipment will create an equally or more effective barrier wall system to prevent off-site migration of contaminated water than was proposed in the original decision document.

Area 3 will be remediated using the zero-valent iron treatment system described in the Decision Document. It is a smaller area, very close to the current building and thus not as amenable to the Lasagna treatment.

In addition, as stated in the Decision Document an Environmental Covenant will be part of any selected remedies.

Decision Criteria

Both the Lasagna™ system and barrier walls were previously evaluated using various threshold and balancing criteria in Corrective Measures Study and summarized in the Decision Document. The threshold criteria for remedy selection includes protection of human health and the environment; attainment of media clean-up standards; controlling the source of the release(s) to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment; and compliance with applicable standards for management of wastes. Balancing criteria included an evaluation of long-term reliability and effectiveness; reduction in the toxicity, mobility, or volume of wastes; short-term effectiveness; implementability; and cost. An evaluation of these criteria is revisited below.

Lasagna™: Lasagna™ treats low permeability soils through the application of DC electrical energy to induce electro-osmosis along with in-situ treatment (e.g., iron filings). The electro-osmosis moves ground water and contamination from anode to the cathode. As the water is forced to move along this electro-osmosis gradient, strategically placed iron filings would intercept and dechlorinate the solvents. Removal efficiency is very high at 90 to 99 percent. Heat generated by the electrical current also mobilizes solvents and increases the efficiency of the process.

Time frame: Two to three years for installation with closure in 5 to 25 years.
Advantages: Removes most of the mass of contamination.

The original disadvantages of this method included a high cost (1.8 to 3 million for Area 1) and disruptions of the current operations at the site. Lessons from recently implemented Lasagna™ projects elsewhere have reduced the cost 30-40% from that presented in the Corrective Measures Study. NCR and Edgetech have jointly determined a method in which the Lasagna installation would not impact current activities. Also, the Lasagna™ technology would be used in conjunction with the previously selected zero-valent iron diffusion hole technology. The Lasagna™ technology will actively reduce contaminant concentrations in the highest concentration source areas, while the zero-valent iron treatment system will react and reduce contaminant concentrations in the rest of contaminated areas.

Ohio EPA accepts NCR's request to use Lasagna™ in Areas 1 and 2 in lieu of the previously selected remedy. Lasagna™ will remediate the source area faster than the previously selected remedy. NCR and Edgetech have resolved issues that could have potentially impacted business activities at the site.

Barrier wall: Clean-up is passively achieved as ground water flows through reactive material placed in the flow path of the ground water plume. NCR evaluated the use of an iron filing barrier wall to reductively dechlorinate solvents to ethane, ethene, and soluble chloride ions.

Time frame: Three months to complete installation, possible long term monitoring (100 years)

Advantages: Relatively quick protection for off-site flow of ground water.

The disadvantages of this as stated in the Decision Document included very little contaminant removal which would only occur at the perimeter. Also long-term monitoring would be required. The phytoremediation was a less costly alternative that could meet the remediation goal and was designed to dewater the soils preventing off-site migration as well as remediating rootzone contamination. Both phytoremediation and the constructed barrier wall with iron filings achieve similar goals of protecting and limiting any off-site flow of groundwater. However, NCR has stated that implementation of Lasagna™ would greatly reduce the cost of installing a reactive barrier due to the co-use of equipment and supplies.

Ohio EPA accepts NCR's proposal to use a barrier wall with iron filings in lieu of phytoremediation in the northeast corner of the site. The barrier wall, coupled with Lasagna™ and the zero-valent iron treatment system, will provide an equivalent remedy.

SUMMARY

Ohio EPA endorses these proposed changes. The Lasagna™ method is a proven technology and will reduce contamination more quickly than the zero-valent iron treatment system. The barrier wall will be designed to eliminate potential off-site migration of contamination and treat any contamination in contact with the barrier.

STATUTORY DETERMINATIONS

The selected remedial action is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to public participation and input and is cost-effective. The remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable to reduce the toxicity, mobility and volume of hazardous substances at the site. The effectiveness of the remedy will be reviewed regularly as part of the remedy implementation process.


Michael A. Savage, Chief
Division of Hazardous Waste Management

Date July 19, 2007