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PROPOSED PLAN OF REMEDIAL ACTION

METAL MASTERS SITE

Smyrna, Delaware

September 1995

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Division of Air & Waste Management
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METAL MASTERS SITE LOCATION

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VOLATILE ORGANIC COMPOUNDS IN SOILS, 1995

VOLATILE ORGANIC COMPOUNDS IN GROUND WATER, 1995

SUMMARY

In December, 1994, the Department of Natural Resources and Environmental Control reached an agreement with Metal Masters Food Service Equipment Co., Inc. to perform a remedial investigation under the **Delaware Hazardous Substance Cleanup Act (HSCA)** at the Metal Masters Site in Smyrna. This investigation was concluded in June, 1995. Based on this work and prior investigations, the Department has determined that the condition of the Metal Masters site does not present an unacceptable risk to public health and welfare or the environment. It therefore recommends no further investigation or action for the potential environmental problems investigated as part of this project.

PURPOSE

The Department issues this proposed plan under the **HSCA** and the *Regulations Governing Hazardous Substance Cleanup* (the Regulations) to present to the public its assessment of the risks posed by the Metal Masters site. A public comment period follows the notification of release of the proposed plan. At the conclusion of the comment period, the Department shall, after review and consideration of comments received, issue a final plan of remedial action.

The procedures for publishing the proposed plan, receiving comments and issuing the final plan are established by the Regulations, Sections 8 and 12, and HSCA.

SITE DESCRIPTION AND HISTORY

The Metal Masters Site is an 11 acre parcel at 655 Glenwood Avenue about 1/2 mile southwest of the Town of Smyrna. The surrounding land use is low density residential with some commercial centers and light manufacturing. The site is on level terrain. Most of it is covered by the plant buildings and paved parking lots. Storm water is directed to a retention basin with overflow discharge to Green's Branch west of the site. A site location map is included at the end of this document.

The parcel has been used as an industrial plant site since approximately 1946. Prior to its occupation by Metal Masters in 1978, it was owned by Clark Equipment Company and operated as a refrigeration equipment manufacturing facility. The site is currently listed on the United States Environmental Protection Agency (EPA) National Priority List (where it is known as the Tyler Refrigeration Site) because of concerns with the operation of two wastewater lagoons formerly located on the northeast portion of the site. Investigations performed under the EPA discovered the presence of 1,1,1-Trichloroethane (TCA) and 1,1-Dichloroethene (DCE) in groundwater. The EPA concluded that the TCA and DCE were not related to the wastewater lagoons but could have been the result of a release of TCA during the time that Metal Masters owned the plant since Metal Masters is known to have used TCA in its process. As a result of an agreement between Metal Masters and DNREC, the investigation into the source and extent of TCA contamination occurred under the State of Delaware's Hazardous Substance Cleanup Program rather than the EPA's Superfund program. Metal Masters engaged Ground Water

Technology, Inc. (GTI) to perform the work required under the agreement. The final dispensation of the EPA's Tyler Refrigeration project will depend on the results of the Metal Masters investigation.

The area is serviced with drinking water by the Town of Smyrna. One of the two municipal supply wells (Well No. 1) is located approximately 1500 feet east of the site. The well draws water from the water table aquifer known as the Columbia formation. It is 100 feet in depth and is screened from 80 to 95 feet. Its capacity is 1000 gallons per minute. Water from Well No. 1 has a history of contamination by organic solvents. In 1992 a treatment system consisting of air stripping and charcoal filtration was required by the Department of Public Health. Subsequently, the requirement for the charcoal filtration was dropped and the town used the charcoal canisters to add green sand filtration for iron and manganese. The treatment system is effective and the water system is in compliance with state and federal regulations governing drinking water supplies.

PRESENT SITE CONDITIONS

Metal Masters moved its operation from the Glenwood Avenue site in the spring of 1995. The property is vacant and for sale.

In May of 1995, six underground storage tanks were excavated from the plant site. They ranged in size from 250 to 20000 gallons and contained gasoline, diesel fuel and heating fuel. The Underground Storage Tank Branch of the Division of Air and Waste Management oversaw the tank removal.

REMEDIAL INVESTIGATION SCOPE AND PROCEDURES

The current investigation was based on information from numerous prior investigations which occurred between 1977 and 1993. These investigations were prompted by concern about the presence of solvents in Well No. 1. While up to 16 potential sources of solvent contamination were identified in the Smyrna area, EPA considered this site the most likely. In 1987 three shallow and three deep wells were placed on the property to assess the groundwater movement and quality in the Columbia formation in the vicinity of the former lagoons. Sampling in 1988 revealed the presence of TCA in the shallow groundwater but the investigation was inconclusive. In 1992 an additional three shallow and three deep wells were placed in the same area. The conclusions from this round of sampling were that there was no contamination in the lower part of the aquifer and that the TCA contamination near the water table was not the result of disposal in the wastewater lagoons. There was an indication of a significant increase in the concentration of TCA in one well from 1988 to 1992.

The present investigation was designed to find the source of this TCA. Three areas were identified as possible source areas: (1) the loading dock where drums of TCA were received, (2) the TCA storage area, and; (3) an underground sanitary sewer holding tank. Six soil borings were distributed among these areas and advanced to about 26 feet below the surface. Soil cuttings were field screened and twelve samples were sent to an approved laboratory to be analyzed for

common volatile organic compounds. An additional three shallow monitoring wells were placed downgradient of the suspected source areas to delineate the extent of the contaminated groundwater. Soil and groundwater samples were taken from each of the wells. Groundwater samples were also taken from the six existing shallow monitoring wells. The three new wells were slug tested so that hydraulic conductivity of the formation could be determined.

The investigation included a study of the possible impact of groundwater contamination at the site on the public water supply and especially on Smyrna Well No. 1. This evaluation used the AT123D (Analytical Transient One-, Two, and Three-Dimensional) Simulation of Waste Transport in the Aquifer System computer model recommended by the EPA.

INVESTIGATION RESULTS

Figures from the GTI report showing the analytical results of soil and ground water samples are reproduced at the end of this document. TCA is the most frequently detected volatile organic compound in both soil and ground water. It was found in two of fifteen soil samples with a maximum concentration of 1.4 parts per million. No other VOCs were found in soil above the laboratory detection limits.

TCA was also found in seven of nine monitoring wells at concentrations ranging from 0.5 parts per billion to 260 parts per billion. Other volatile organic compounds detected in monitoring wells with their frequency of detection and concentration ranges are as follows: 1,1-Dichloroethene (4 of 9, 0.5 to 26 parts per billion), 1,1 Dichloroethane (3 of 9, 0.7 to 13 parts per billion), Trichloroethene (2 of 9, 2.8 to 5.7 parts per billion) and Tetrachloroethene (2 of 9, 0.5 to 0.7 parts per billion).

The distribution of VOC contamination in soil and ground water indicate that the historic source was near the TCA storage area. Little residual contamination remains in soil. The highest concentrations of VOCs in groundwater occur at well MM-2, approximately 200 feet downgradient from the suspected source area. The levels diminish significantly at wells MM-1 and S-6, the next closest downgradient wells. Both the degree and extent of groundwater contamination suggest that a very limited spill might have occurred in the storage area prior to 1988.

HUMAN HEALTH AND ENVIRONMENTAL RISK ASSESSMENT

This remedial investigation included a detailed evaluation of potential risks of five volatile organic compounds present in the study area to human health and the environment. The following exposure pathways were determined to be complete and relevant:

1. Individuals on the site could be exposed to volatiles migrating from the subsurface into indoor air via inhalation.
2. Area residents could be exposed to chemicals in the public water supply via ingestion, dermal contact and inhalation.

- Chemicals in groundwater could potentially migrate toward surface water bodies and affect fauna and flora.

Ingestion of ground water from the site was not considered because there are presently no water supply wells on the site and installation of private wells in the future is prohibited by state regulations and town ordinances. The risk assessment procedure used site specific information and also standard default values developed by EPA which relate to the frequency and duration of exposure and toxicity of the contamination.

QUANTITATIVE CLEANUP OBJECTIVES

The risk assessment procedure was used to establish site specific cleanup objectives that are protective of human health, welfare and the environment as defined in the Regulations. This process consists of answering the question, "What is the greatest concentration of contamination which can occur at the site without causing an exceedence of 'acceptable risk'?" The question is repeated for each chemical in each complete exposure pathway. The lowest concentration for each chemical is then chosen as the protective cleanup objective. At the Metal Masters site, protective cleanup levels turned out to be based on the exposure to volatiles migrating from the subsurface to indoor air exposure pathway. Groundwater contamination at the site appears to have no present impact on contamination in Smyrna Well No. 1. Table 1 compares maximum and average concentrations in ground water of the five contaminants of concern at the site to the cleanup objectives.

Table 1. Comparison of Groundwater Cleanup Objectives to Site Contamination

Chemical	Site concentration (maximum) (µg/l)	Site concentration (95% UCL of mean) (µg/l)	Site specific cleanup objectives* (µg/l)	AWCQ (µg/l)	MCL (µg/l)
1,1-Dichloroethane	13	4.82	785,400	(none)	(none)
1,1-Dichloroethene	26	9.75	33	11,600	7
1,1,1-Trichloroethane	260	100	515,000	31,200	200
Trichloroethene	5.7	2.51	16,700	81,800	5
Tetrachloroethene	0.7	0.41	22,800	10,200	5

Notes on Table 1:

µg/l--micro grams per liter or parts per billion

95% upper confidence level (UCL) of mean--at a 95% confidence level, the uppermost expected value of the average of the sample results based on the number of wells, their average concentration and variance

AWQC--Ambient Water Quality Criteria (US EPA, 1986)

MCL--Maximum Contaminant Level established by the EPA under the Safe Drinking Water Act 1992

* in some cases, the cleanup objectives exceed solubility limits

The table shows that the site specific cleanup objectives far exceed the maximum contamination at the site for all of the compounds except 1,1-Dichloroethene. For it, the cleanup level slightly exceeds the maximum concentration in the site groundwater.

The EPA has established Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act for some of the chemicals detected in ground water at the Metal Masters site. MCLs are intended to apply to public water systems. Although the data from the Metal Masters site represents chemical concentrations in shallow groundwater under an industrial site it may be compared to safe drinking water levels. This method adds a tier of conservatism to the evaluation because it does not consider the further attenuation and dilution of ground water expected to occur before it is introduced to the drinking water supply. MCLs are available for four of the five volatile organic chemicals found in groundwater at Metal Masters and are given in Table 1 above. There is no MCL for 1,1,-Dichloroethane. The maximum concentrations in site ground water slightly exceed the MCLs of four chemicals. When concentrations of eight wells are averaged, only 1,1-Dichloroethene exceeds the MCL. The method used to average concentrations follows EPA and HSCA guidelines.

Table 1 also shows *Ambient Water Quality Criteria* (AWQC) established by EPA for the protection of aquatic life. For each of the chemicals shown, the AWQC is greater than the MCL. Cleanup levels which are protective of drinking water at the site are therefore also protective of aquatic life in surface water bodies.

The conclusion of the risk assessment and cleanup objective setting process is that contaminant levels in ground water are already below site specific cleanup levels and below or just above established drinking water standards.

PROPOSED REMEDIAL ACTION PLAN

Based on the information gained in this investigation and in view of the absence of unacceptable risks associated with the soil and groundwater contamination at the Metal Masters Site, the Department requires no further investigation or remediation.

PUBLIC PARTICIPATION

The Department actively solicits public comments or suggestions on the proposed plan and welcomes questions. Please direct written comments to: **Superfund Branch, Attn: Stephen F. Johnson, 715 Grantham Lane, New Castle, DE 19720**, or call (302) 323-4540. The Remedial Investigation Report and other documentation supporting this Proposed Plan are available for reading and copying at the above address from 8:00 to 4:30, Monday through Friday. The public comment period closes on October 2, 1995.

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