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**U.S. DOE-FEMP HAZARDOUS WASTE
OH 689 0008 976
HAMILTON COUNTY TSD-GEN**

02/04/92

**OEPA/DOE-FO
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LETTER**



State of Ohio Environmental Protection Agency

Southwest District Office

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Original File Co.

A.R.

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George V. Voinovich
Governor

February 4, 1992

RE: U.S. DOE-FEMP
HAZARDOUS WASTE
OH 689 0008 976
HAMILTON COUNTY
TSD-GEN

Mr. R. E. Tiller, Manager
U.S. DOE-FEMP
P.O. Box 398705
Cincinnati, Ohio 45239-8705

Dear Mr. Tiller:

A RCRA detection monitoring program for U.S. DOE Feed Materials Production Center (now Fernald Environmental Management Project/FEMP) Waste Pit 4 was initiated in August, 1985. On November 13, 1987, U.S. DOE notified U.S. EPA and Ohio EPA that Waste Pit 4 could be affecting ground water quality. FEMP was subsequently placed into an Assessment Monitoring Program pursuant to OAC 3745-65-93. DOE-FEMP then developed a Groundwater Quality Assessment Program Plan (GQAPP) for Waste Pit 4, and has submitted annual reports for calendar years 1989 and 1990 concerning groundwater quality.

On December 23, 1991, DOE-FEMP submitted a RCRA Groundwater Monitoring Plan (GWP) designed to replace the GQAPP as a result of additional RCRA regulated units identified in the July 1991 Part A Permit Application submittal. This document is currently under review. During two meetings held at OEPA SWDO in 1991, DOE/WMCO representatives presented OEPA with information concerning selected groundwater issues related to CERCLA/RCRA integration, and OEPA acknowledges current DOE/WMCO efforts to reach integration agreements in these program areas.

Results of the GWP review and CERCLA/RCRA integration attempts notwithstanding, this office would like to bring to your attention several concerns which we regard as violations within the FEMP groundwater program. With the assistance of Mr. Mike Proffitt, Division of Drinking and Ground Waters (DDAGW), this office has completed a review of DOE-FEMP 1989 and 1990 Annual Groundwater Assessment Reports. These reports were reviewed to assess DOE-FEMP compliance with applicable portions of Ohio Administrative Code (OAC) 3745-65-90 through 3745-65-94.

File F-1711

Annual Report Reference:

[The 1989 annual report comprised three separate submittals: The Feed Materials Production Center RCRA Annual Report submitted March 1, 1990; untitled updates for the RCRA Annual Report submitted May 22, 1990; the RCRA Groundwater Quality Assessment Program Progress Report for 1989 Final Update submitted October 25, 1990. These documents are referenced as Report 1, Report 2, and Report 3. The 1990 annual report (volumes I and II) was submitted February 25, 1991.]

DOE-FEMP is in violation of the following OAC regulations relating to groundwater monitoring requirements for hazardous waste facilities:

1) VIOLATION OF OAC 3745-65-93(D)(4)(a)

GENERAL COMMENTS:

DOE-FEMP needs to obtain site specific hydrogeologic parameters in order to properly calculate the rate and extent of the migration of hazardous waste or hazardous waste constituents in the ground water. In the 1990, report section 3.3.5.1, DOE-FEMP indicated that the time versus concentration method for migration determination would be used until modeling results are available. These results will still be highly questionable until site specific hydraulic parameters are obtained for the area via pumping tests or recovery tests.

The 1989 report indicates that the lower aquifer (4000 series monitoring wells) may be contaminated. If this is true, then DOE-FEMP needs to define the rate and extent of ground water contamination in this zone as per OAC 3745-65-93(D)(4)(a and b).

SPECIFIC COMMENTS:

a) 1989 Report 2, Page 13, para 2- This paragraph references Geotrans and Spieker for values of hydraulic conductivity. In order to properly calculate the rate and extent of migration of hazardous waste or hazardous waste constituents in the ground water, DOE-FEMP should obtain site specific data. Calculations based on regional values for hydrogeologic characteristics will not accurately represent site characteristics. In order to adequately determine the hydrogeologic characteristics found at the site, individual pumping tests (or slug tests in the case of units with low hydraulic conductivity) should be performed on a sufficient number of locations for each aquifer.

- b) 1990 Page 21, section 3.3.2, para 2- This paragraph states that the hydraulic conductivity in the upper aquifer (2000 and 3000 series level) is approximately 450 ft/day as determined through the RI/FS investigation. This information has not yet been released to Ohio EPA and presently cannot be verified. The Department of Energy should submit this data to Ohio EPA as soon as possible.
- c) 1989 Report 2, Page 13, para 3- The velocity of ground water flow reported is not based upon site specific data. DOE should provide Ohio EPA with documentation reinforcing the given flow velocity.
- d) 1990 Page 2 para 4- The rate of contaminant migration is based upon estimates of ground water flow rates. Site specific pump tests (or slug tests in units with low hydraulic conductivities) should be performed to verify estimates.
- e) 1989 Report 2, Page 13, para 3- DOE did not provide any ground water flow velocities for the glacial till.
- f) Upgradient water quality for monitoring wells 1052, 1024, 2066, 3066, 2043, 3043 were compared to all downgradient monitoring wells by Ohio EPA DDAGW. With the exception of 1038, 1004, 4001, 4008, 4010, and 2055, all downgradient monitoring wells indicated contamination. Additionally, upgradient monitoring wells 2066 and 3066 yielded questionable water quality when compared to 3043. These "upgradient" monitoring wells had high conductivity, high chloride, high iron, and high sulfate. As a result, monitoring well 3043 was used by Ohio EPA DDAGW as the upgradient reference.

Based upon the geometric pattern of ground water contamination, DOE has failed to define the outermost perimeter of contamination; and has therefore failed to determine the full extent of ground water contamination as per OAC 3745-65-93(D)(4)(a and b).

- g) 1990 Page 2, para 2- This paragraph states that elevated levels of "additional inorganic constituents have been detected in the plume, but are inconsistent and are not used to trace plume movement." DOE-FEMP needs to provide Ohio EPA with the supporting data and rationale that they used to determine this.

h) 1990 Page 36, section 3.3.5.1- This section describes the method which DOE used to determine the rate of contaminant migration. This method assumes a linear relationship between contaminant concentration, distance, and time. This method does not take into account variability in hydraulic conductivity, transmissivity, storativity (specific yield), or recharge. The DOE should provide Ohio EPA the data which supports these assumptions.

i) DOE-FEMP solely uses statistical analysis to verify the presence of contaminants in monitoring wells. Ohio EPA recommends the use of "best professional judgment" coupled with statistical analysis to determine contamination. Ohio EPA and DOE-FEMP need to clarify how contamination will be determined.

j) The rate and extent of migration of hazardous waste or hazardous waste constituents in the ground water should not be calculated based solely upon non-statistical methods. Ground water data should be reviewed and compared to accepted background concentrations to determine ground water contamination. The use of statistics to define the rate and extent of migration of hazardous waste or hazardous waste constituents in the ground water can overlook lower concentrations of contaminants which this monitoring program is designed to include. Hydrogeological and geochemical factors must also be addressed in the determination of the rate and extent of migration.

k) 1989 Report 2, Page 17, para 1- This paragraph indicates that the lower aquifer is contaminated, however no ground water flow velocity, hydraulic gradient, or hydraulic conductivity is provided for this unit.

VIOLATION SUMMARY:

Based upon the above comments, DOE-FEMP is in violation of OAC 3745-65-93(D)(4)(a), and has failed to determine the rate and extent of migration of hazardous waste or hazardous waste constituents in the groundwater.

DDAGW believes that aquifer pump tests (or slug tests in the case of formations with low hydraulic conductivity) are needed to characterize the hydrogeological characteristics of all water bearing units found at the FMPC site. These tests should be performed at a frequency so as to adequately

represent the aquifer units throughout the site and affected off site areas. Without this data, DOE-FEMP cannot adequately define the rate and extent of hazardous waste or hazardous waste constituent migration in the ground water. As a result, DOE-FEMP cannot satisfy the requirements of OAC 3745-65-93(D)(4)(a).

RESPONSE REQUIREMENT:

Within ninety (90) days from the date of this letter DOE-FEMP must submit to OEPA, plans that incorporate procedures and schedules for the development of site specific hydrogeological data for the DOE-FEMP site.

2) VIOLATION OF OAC 3745-65-93(D)(4)(b)

a) 1989 Report 2- DOE-FEMP needs to identify all hazardous waste constituents disposed of in Waste Pit 4.

b) 1989 Report 2, Page 3, Table 1- It is unclear to DDAGW if this table represents all hazardous waste constituents disposed of in Waste Pit 4. This list should be compared to the results of the waste characterization study for Waste Pit 4 and checked for completeness.

RESPONSE REQUIREMENT:

DOE-FEMP must respond to OEPA with this information within thirty (30) days from the date of this letter.

3) VIOLATION OF OAC 3745-65-93(D)(3)(d)

a) 1989 Report 1- This report indicates that selected wells were sampled for selected parameters. This action is not consistent with the regulations. As stated in OAC 3745-65-93(D)(3)(d), all RCRA assessment monitoring wells should be sampled for all parameters described in the Sampling and Analysis Plan.

RESPONSE REQUIREMENT:

DOE-FEMP is in violation of OAC 3745-65-93(D)(3)(d). Future sampling methodology and procedures should strictly adhere to the approved Sampling and Analysis Plan.

4) VIOLATION OF OAC 3745-65-91(A)(1)(a) and (b).

a) Upgradient water quality for monitoring wells 1052, 1024, 2066, 3066, 2043, 3043 were compared to all downgradient monitoring wells by Ohio EPA DDAGW. With the exception of 1038, 1004, 4001, 4008, 4010, and 2055, all downgradient monitoring wells indicated contamination. Additionally, upgradient monitoring wells 2066 and 3066 yielded questionable water quality when compared to 3043. These "upgradient" monitoring wells had high conductivity, high chloride, high iron, and high sulfate.

b) 1990 Page 11, section 3.2.3- There may be problems with monitoring wells 2066 and 3066 based upon inorganic results. These "upgradient" monitoring wells had high conductivity, high chloride, high iron, and high sulfate when compared to background. As a result, these monitoring wells may not be suitable for use as background wells. As a result, the use of these wells in statistical analysis may skew the results and mask contamination.

c) 1990 Page 27, para 1- The presence of such high concentrations of chloride (2.75 to 826 ppm) indicates a problem with well 3066. This clearly does not represent background ground water quality. This well should be inspected and replaced if necessary.

d) 1989 Report 1, Page 12, para 1- DOE-FEMP proposed to update upgradient background data. This is inconsistent with the intent of OAC 3745-65-90 through 94 and should not be done.

RESPONSE REQUIREMENT:

Within sixty (60) days from the date of this letter, DOE-FEMP must submit to OEPA a report documenting the findings of hydrogeological investigations conducted to determine the suitability of these wells.

OEPA SWDO staff is available to meet with DOE-FEMP representatives to discuss the above RCRA violations and issues related to RCRA groundwater requirements. Should you have questions in this regard, please feel free to contact either Mr. Mike Proffitt at (513) 285-6073, or myself at (513) 285-6090.

Mr. R. E. Tiller, U.S. DOE-FEMP
February 4, 1992
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Sincerely,

Phillip C Harris

Phillip C. Harris
Division of Hazardous Waste Management

cc: Laurie Stevenson, RCRA Enforcement, CO
Jim Saric, USEPA-V
Graham Mitchell, OEPA SWDO
Tom Schneider, OEPA SWDO