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**GROUNDWATER MONITORING AT U.S. DOE
FMPC-FERNALD, OHIO**

03/23/89

**DOE-828-89
DOE-FSO/USEPA
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LETTER**

**Department of Energy**

FMPC Site Office
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(513) 738-6319

March 23, 1989
DOE-828-89

Mr. Basil G. Constantelos
Director, Waste Management Division
U.S. Environmental Protection Agency
Region 5ME-14
230 South Dearborn St.
Chicago, IL 60604

Dear Mr. Constantelos:

GROUNDWATER MONITORING AT U.S. DOE FMPC-FERNALD, OHIO

Reference: Letter, W. E. Muno to J. A. Reafsnyder and M. B. Boswell, "Groundwater Monitoring - U.S. DOE FMPC - Fernald OH6 890 008 976," February 3, 1989

This letter provides by attachments: 1) response to U.S. EPA review comments on the FMPC RCRA Groundwater Quality Assessment Program Plan (GQAPP) for Waste Pit No. 4, and RCRA Sampling Rounds 4, 5 and 6 reports, and 2) a revised FMPC RCRA Groundwater Quality Assessment Program Plan. EPA's comments on these documents, detailed in the referenced letter, were received by DOE on February 7, 1989. DOE submitted the original GQAPP to EPA on November 25, 1987.

This revised Assessment Plan also satisfies the requirements of Section 3.7 of the Consent Decree, State of Ohio v. U.S. Department of Energy, et al.

If you have any questions, or require additional information, please contact Mary Stone, of my staff, at 513-738-6655.

Sincerely,


James A. Reafsnyder
Site Manager

DP-84:Craig

Attachment: As stated

cc w/o att:

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G. Bodenstein, DOE/ORO

C. McCord, U.S. EPA

R. Bendula, OEPA

L. Bogar, WMCO

C. Conner, WMCO

cc w/att:

G. Mitchell, OEPA

L. Sparks, DOE/ORO

M. Galper, WMCO

ATTACHMENT I

Response to EPA comments on Rounds 4 and 5
Groundwater Monitoring Reports,
and the Groundwater Quality Assessment Plan.

4th Quarter Sampling**(1) Comment:**

The Results and Conclusions section of the May 1987 RCRA Groundwater Monitoring Report - Round 4 concluded that the distribution of radiological and non-radiological constituents appear to be localized around waste pit #4. No confirmatory sampling was performed, as required by 40 CFR 265.93(c)(2).

Response:

No deficiency exists since EPA regulations were followed correctly. Round 4 sampling was done in November 1986 to complete the detection monitoring requirements of 40 CFR 265.92(c)(1). Detection monitoring established background concentrations through one year of quarterly sampling. A statistical difference was noticed in some of the indicator parameters following Round 5 sampling which was done to fulfill the semi-annual sampling requirements of 40 CFR 265.92(d). The confirmatory sampling requirements of 40 CFR 265.93 (c)(2) were fulfilled by Round 6 sampling (report issued to EPA March 1987).

Resolution:

No further action required.

(2) Comment:

Page 3 - The report states that a well rehabilitation program is planned that will include disinfection. It is not appropriate that any substance be introduced into any monitoring wells.

Response:

The well rehabilitation program was completed in the Spring 1988. Fifteen wells were repaired. No substances including disinfectants were introduced into the wells during this rehabilitation program.

Resolution:

No further action required.

(3) Comment:

Table 3.4 - The standards are out of date. There are primary drinking water standards for several volatile organic compounds (VOC) that are not listed. The fluoride standard is out of date; the current primary standard maximum concentration level (MCL) is 4 mg/l and secondary standard is 2 mg/l.

Response:

The standards referenced for fluoride in table 3.4 was out of date and the drinking water standards for some VOC were not listed. However, this did not affect the quality or accuracy of the data presented.

Resolution:

The correct standards will be referenced as appropriate in all future submittals.

(4) Comment:

Table 2 - Samples collected for VOC analysis should be collected in 40 ml septum vials, not 1000 ml glass containers.

Response:

The specification of 1000 ml glass containers for collecting VOC samples for analysis was incorrectly stated in table 2. Samples for VOC analysis were collected in 40 ml septum vials.

Resolution:

No further action required.

(5) Comment:

All samples collected for pesticide analysis were held past the holding times. Some samples were held for just under two months. The holding time for the sample collected from well MW-21(S) exceeded the VOC holding time limit of fourteen (14) days. The sample was held for twenty-nine (29) days.

Response:

Efforts are being made to observe proper holding times. Pesticide and VOC sampling was repeated March-April 1988 for Round 1 of assessment monitoring during which the proper holding times were observed.

Resolution:

Efforts will be continued to ensure that proper holding times for all samples are observed.

5th Quarter Sampling**(1) Comment:**

All "TP" wells were installed with a backhoe. The newly developed well decommissioning criteria should be applied to these "TP" wells for evaluation of well decommissioning.

Response:

Well decommissioning criteria do apply to the test pit (TP) wells. Once an evaluation for well decommissioning has been made the test pit wells will either remain in service or be decommissioned appropriately.

Resolution:

No further action required.

(2) Comment:

The observation of surface water flowing under the surface seal of well MW-10 and the fact that not all older wells have protective covers needs to be addressed.

Response:

A well renovation program was completed in Spring 1988. Repairs were done to fifteen wells including MW-10 and the older wells mentioned above. Well MW-10 was repaired to prevent surface water from flowing under its surface seal. Also, protective covers were installed on all older wells that needed them.

Resolution:

No further action required.

(3) Comment:

Page 7 - Low yielding wells should be pumped dry unless a minimum of three to five well volumes are removed from the well.

Response:

The well development procedure for low yielding wells is to pump the well dry unless a minimum of three to five well volumes can be removed. Current well development procedures are in Revision 1 of the Groundwater Quality Assessment Program Plan (GQAPP) and Revision 3 of the RI/FS Work Plan.

Resolution:

No further action required.

(4) **Comment:**

Page 13 - TOC samples must have a preservative to adjust pH below 2. TOX samples must have 1 ml of 1.1 M sodium sulfite added for preservation.

Response:

Preservative is applied to TOC samples to adjust the pH below 2. Also, 1 ml of 1.1 M sodium sulfite is added as preservative to TOX samples. Current sampling procedures can be referenced in the GQAPP Rev. 1 and the RI/FS Quality Assurance Project Plan Revision 3.

Resolution:

No further action required.

(5) **Comment:**

Page 14 - What are the sampling procedures for dissolved metals?

Response:

For dissolved metals the samples are filtered immediately following collection on site. Preservatives are then added. Further details on the sampling procedures can be referenced in Revision 3 of the RI/FS Quality Assurance Project Plan.

Resolution:

No further action required.

(6) **Comment:**

Page 14, Paragraph 5 - The use of acetone was not mentioned.

Response:

Acetone was used to clean equipment during Round 5 detection monitoring. This practice was discontinued after it was discovered that the acetone was contaminating the samples. Current procedures for cleaning equipment during sampling can be referenced in Revision 1 of the Groundwater Quality Assessment Program Plan (GQAPP) and Revision 3 of the RI/FS Work Plan.

Resolution:

No further action required.

(7) **Comment:**

Page 15, Item 3: The report does not detail how equipment cleaning and laboratory analytical procedures will be modified in future rounds to prevent false results.

Response:

Sampling procedures were revised to discontinue the use of acetone for cleaning equipment between samples. Equipment is now cleaned using deionized water rinses. Current sampling procedures can be referenced in Revision 1 of the GQAPP and Revision 3 of the RI/FS Quality Assurance Project Plan.

Resolution:

No further action required.

(8) **Comment:**

Page 16, Table 2 - VOC samples should be collected in 40 ml septum vials, not 1000 ml glass containers.

Response:

The specification of 1000 ml glass containers in Table 2 for collecting VOC samples was an error. Samples for VOC were collected in 40 ml septum vials.

Resolution:

No further action required.

(9) **Comment:**

Page 18 - 40 CFR 265.92(c)(2), not 40 CFR 265.90, requires four replicates.

Response:

The correct reference intended to be made on page 18 is 40 CFR 265.92(c)(2) which specifies four replicate samples for indicator parameters.

Resolution:

Accurate references will be made in future submittals.

(10) Comment:

Table 3.5 - Some of the standards are out of date. MCL's for VOC's are not given. The standard for fluoride is incorrect.

Response:

Some of the standards for hazardous constituents referenced in Table 3.5 in the Round 5 RCRA detection monitoring report were out of date. However, this error did not compromise the analytical data presented.

Resolution:

Correct standards will be referenced in future submittals.

(11) Comment:

In what order will samples for certain parameters be collected? It is desirable to establish an order.

Response:

Samples are collected in accordance with the stability and volatility of the parameters to be tested. For example, samples for HSL volatile organic compounds, pH, specific conductance, and temperature are collected first. Parameters which not are sensitive to pH or volatilization are drawn last.

Resolution:

No action required.

(12) Comment:

Neither the actual data used to calculate the statistics, nor the calculations, have been included.

Response:

Appropriate data and statistical methods were used for all calculations as prescribed by 40 CFR 265.92 & 265.93. The RCRA Groundwater Monitoring Report - Round 5, Vol. 5, Nov. 1987 provided the data and statistical calculation. A copy of this report was transmitted to EPA 11/13/87.

Resolution:

No further action required.

(13) Comment:

Pesticide samples were held past the seven day holding time limit for many samples.

Response:

Efforts are being made to observe the correct holding times on all samples. This is evidenced by pesticide samples which were taken March-April 1988 during Round 1 assessment monitoring with correct holding times being observed.

Resolution:

Efforts will continue to be made to observe the holding times as prescribed by the sampling procedures.

Groundwater Quality Assessment Program Plan**(1) Comment:**

The sampling frequency for Assessment monitoring is quarterly, not semi-annually for site-specific parameters, as required by 40 CFR 265.93(d)(7)(i) and Ohio Administrative Code (OAC) 3745-65-93(D)(7)(i).

Response:

A semi-annual sampling frequency for site specific parameters, during assessment monitoring, was incorrectly stated. However, assessment monitoring, which started March 1988, has been done quarterly.

Resolution:

Quarterly sampling for site specific parameters has been specified in Revision 1 of the Groundwater Quality Assessment Program Plan (GQAPP).

(2) Comment:

The Assessment Plan does not describe the detection monitoring system used to make the statistical comparisons.

Response:

A groundwater detection monitoring system as specified by 40 CFR 265.91 was used to obtain data for the statistical comparisons done. This information was supplied to the EPA in Rounds 1-5 detection monitoring reports.

Resolution:

The detection monitoring system used to make statistical comparisons is described in Sections 3.1 through 3.3 of Revision 1 of the GQAPP.

(3) Comment:

The Assessment Plan and the Sampling Plan do not present adequate information concerning the location, depth of screened intervals, or length of screen intervals.

Response:

Information concerning the location, depth of screen intervals, and length of screen was presented in the GQAPP.

Resolution:

The location, depth of screened intervals and the length of screen intervals is described in Section 4.2 and Table 4 of the revised GQAPP.


(4) Comment:

The Assessment Plan and the Groundwater Monitoring Reports need to establish the direction of groundwater flow in each of the monitored aquifers. The Assessment Plan indicates that the localized direction of groundwater flow is towards the east. A review of the water levels and use of three-point problems indicates that the groundwater flow in the shallow aquifer is towards the northeast.

Response:

Statements about groundwater flow made in the Groundwater Quality Assessment Program Plan were based on data available at that time.

Resolution:

Revision 1 of the GQAPP provides details on current information on a groundwater flow.

(5) Comment:

Using either flow direction, east or northeast, indicates that the landfill (waste pit #4) is not monitored by the required three downgradient wells, as required by 40 CFR 265.91(a)(2) and OAC 3745-65-91(A)(2).

Response:

The downgradient wells utilized as part of the RCRA detection monitoring at waste pit #4 were installed based on knowledge available at that time. These wells supplied enough data to indicate that a RCRA assessment monitoring program was needed. Additional wells were installed in the waste storage area to improve the knowledge of the groundwater flow.

Resolution:

Revision 1 of the GQAPP describes the updated monitoring network, incorporating newly installed RI/FS wells, being used to fulfill the requirements for RCRA assessment monitoring.

(6) Comment:

Section 3.1, Page 11 - A.0.01 level of significance should have been used instead of 0.05 level.

Response:

The 0.05 level of significance used for the Student's T-test did not affect the determination of a statistical difference in indicator parameters which caused the initiation of a RCRA assessment monitoring program.

Resolution:

The appropriate statistical procedures will be utilized in any future statistical determinations.

(7) Comments:

Section 3.1, Page 11 - The variance for TAWS values is extremely large. This is due to a two-order of magnitude increase of TAWS in background wells during the third sampling round. Elevated values of this magnitude for TAWS were not observed after round three, suggesting that the third round data may be anomalous.

Response:

The very large TOX variances was due to a two-order of magnitude increase of TOX concentrations recorded during third round detection monitoring sampling.

Resolution:

Strict sampling and analytical quality control procedures are being employed to limit errors in the data being compiled. Sampling and analytical methods can be reviewed in Revision 1 of the GQAPP.

(8) Comment:

Section 3.2, Page 16 - The continued collection of additional RCRA groundwater monitoring samples and the list of sample parameters is appropriate. However, sampling and analytical methods are not listed, as required by 40 CFR 265.93(d)(3)(ii) and OAC 3745-65-93(D)(3)(ii).

Response:

The GQAPP state that the additional RCRA monitoring was to be conducted as part of the RI/FS program. The sampling and analytical procedures are contained in the RI/FS Work Plan Revision 3.

Resolution:

Revision 1 of the GQAPP provides sampling and analytical methods in Sections 4.4 and 4.5.

(9) Comment:

Section 3.2, Page 17 - The Assessment Plan does not provide a reason for the additional upgradient wells. No information is presented concerning the establishment of background mean and variance values for the indicator parameters. Information on new background well or wells should be provided.

Response:

The Groundwater Quality Assessment Plan stated that the additional upgradient wells were being installed "as specifically requested by Ohio and U.S. EPA." Also, information was presented in Section 3.1 on the establishment of background mean and variance values for indicator parameters. Revised information on the rationale for well placement and the establishment of background mean and variance values for indicator parameters are being discussed in detail in Sections 3 and 4.2 of the GQAPP Revision 1.

Resolution:

None necessary.

(10) Comment:

Section 3.3, Page 17, - Results of the Characterization Investigation Study (CIS) should be used in selecting appropriate analytes for the assessment program.

Response:

Results of the Characterization Investigation Study were used to select the appropriate analytes for assessment. This issue is discussed in detail in Section 3.4.2 of Revision 1 of the GQAPP.

Resolution:

None necessary.

(11) Comment:

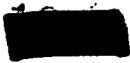
Section 3.4, Page 17 - The wells discussed in this section may be appropriate for monitoring pit #4.

Response:

Wells to be used for monitoring in the vicinity of waste pit #4 are discussed in Section 4.2 and listed in table 3 Revision 1 of the GQAPP.

Resolution:

None necessary.



(12) **Comment:**

Section 4.0, Page 24-41 - This general discussion of Remedial Investigation (RI) activities does not address the specific situation at waste pit #4.

Response:

The specific situation at waste pit #4 was not the entire focus of Section 4 even though the discussion on the RI/FS was relevant.

Resolution:

Section 4.0 of the GQAPP has been revised to focus specifically on the waste pit #4.

(13) **Comment:**

Section 4.2 - There are several errors in this section, including screened intervals and zones that are to be monitored.

Response:

Section 4.2 of the GQAPP contained a discussion of the screened intervals of the wells and the zones to be monitored. The errors referred to need to be specifically identified. Section 4.2 of the GQAPP Revision 1 has been rewritten and discusses screen intervals of wells and the zones to be monitored.

Resolution:

None necessary.

(14) **Comment:**

Section 4.3 - The Installation Methods and Materials section needs to be rewritten to correct numerous errors with respect to screened intervals and zones to be monitored.

Response:

Section 4.2 of the GQAPP contained a discussion of the screened intervals of the wells and the zones to be monitored. The numerous errors with respect to screen intervals and zones to be monitored need to be specifically identified. Section 4.2 of the GQAPP Revision 1 has been rewritten and discusses screened intervals of wells and the zones to be monitored.

Resolution:

None necessary.




(15) Comment:

Section 4.6, Page 37 - The Assessment Plan must include sampling and analytical methods for relevant hazardous wastes and hazardous waste constituents, as required by 40 CFR 265.93(d)(3)(ii). References to the RI groundwater monitoring in the Assessment Plan is not adequate, even though the RCRA and RI groundwater monitoring systems have been merged.

Response:

Sampling and analysis was discussed in the GQAPP even though specific sampling and analytical methods were not discussed.

Resolution:

Sampling and analytical methods are discussed in Section 4.4 and 4.5 with details included as appendices in Revision 1 GQAPP.

(16) Comment:

The facility must determine the rate, extent of migration, and concentrations of hazardous waste or hazardous waste constituents, as required by 40 CFR 265.93(d)(4) and OAC 3745-65-93(D)(4).

Response:

This is the objective of Groundwater Quality Assessment Program Plan Revision 1 of the GQAPP provides details of the current program.

Resolution:

No action required.

(17) Comment:

Confirmatory sampling required by 40 CFR 265.93(c)(2) is not presented in the Assessment Plan.

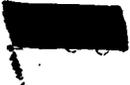
Response:

Confirmatory sampling was performed in December 1987 during Round 6 of the groundwater monitoring program. A report was issued March 1988.

Resolution:

Section 3.3 of the GQAPP Revision 1 discusses confirmatory sampling.




(18) Comments:

Please clarify what existing and newly installed Remedial Investigation (RI) wells are considered a part of the RCRA ground water monitoring system and are used in the assessment.

Response:

The wells to be used for RCRA groundwater monitoring and RI/FS were discussed in the GQAPP.

Resolution:

Sections 3 and 4 of Revision 1 GQAPP provide specific details on which wells are part of the RCRA groundwater monitoring system.

(19) Comments:

Water samples should be taken from Paddy's Run to check local groundwater flow discharging to the creek from the facility.

Response:

Sampling of the water and sediments in Paddy's Run is within the scope of the RI/FS as defined in Revision 3 of the RI/FS Work Plan.

Resolution:

Sediment and surface water is being sampled as part of the RI/FS surface water and sediment sampling program.

(20) Comment:

Page 20 - If contamination is found, site-specific parameters are required by 40 CFR 265.93(d)(3)(ii) and must be monitored quarterly until final closure, as required by 40 CFR 265.93(d)(7)(i) and OAC 3745-65-93(D)(7)(i).

Response:

RCRA assessment monitoring wells are being sampled quarterly for site specific parameters. Section 3.4.2 of the GQAPP Revision 1 provides details on the assessment monitoring program.

Resolution:

None required.

(21) Comment:

Page 33 - Should contamination be found above the blue clay layer, additional wells should be installed immediately below the clay and at the bottom of the sand and gravel aquifer. Positioning the bottom of the screen 10 feet above the bedrock will not allow for detection of dense constituents.

Response:

Investigations conducted up to this point have not indicated any hazardous waste constituents below the blue clay layer. Should any hazardous waste constituents be discovered at some future date during the course of RI/FS and RCRA assessment activities, an evaluation will be made and an appropriate course of action pursued.

Resolution:

No further action required.

(22) Comment:

Page 33 - Whether or not the clay unit is an aquitard has not been clarified. Tests may be proposed for verifying this statement.

Response:

The RCRA assessment and RI/FS programs are currently investigating the rate and extent of migration of site specific parameters. Groundwater modeling is being conducted as part of the RI/FS to investigate water movement through the blue clay. This modeling is anticipated to be completed by third quarter 1990.

Resolution:

No further action required.

(23) Comment:

Page 33 - A 15-foot well screen is too long. The screen should span the water bearing zone with a maximum length of 10 feet. The sand pack should not exceed 15 feet.

Response:

A fifteen foot screen on 2000 series wells was discussed in Section 4 of the RI/FS Work Plan Revision 3 which was approved by the EPA in May 1988.

Resolution:

No further action required.

(24) Comment:

Page 35 - A minimum of three to five well volumes should be extracted during well development.

Response:

Although not clearly stated on page 35, a minimum of three to five well volumes are extracted from the groundwater monitoring wells during well development. Well sampling procedures are discussed in detail in Revision 1 of the GQAPP.

Resolution:

No further action required.

(25) Comment:

Page 36 - Identify which wells will be used for pump/slug tests.

Response:

Wells to be used for pump/slug tests were identified on pages 35 and 36 of the GQAPP.

Resolution:

Section 4.6 of the revised GQAPP discusses well usage for slug tests.

(26) Comment:

Page 37 - Which of the wells designated to monitor Pit #4 are to be sampled for the organics and metals in item 1? What constituents will each well be sampled for? All existing and proposed wells that monitor Pit #4 should be analyzed for RCRA hazardous waste constituents, as indicated by the RI work plan.

Response:

A discussion was presented on the RCRA constituents to be sampled and the frequency of this sampling.

Resolution:

The wells designated to monitor the groundwater quality in the vicinity of Pit #4 and the RCRA hazardous constituents for which they will be sampled and analyzed are outlined in Sections 3 and 4 of Revision 1 of the GQAPP.

(28) **Comment:**

Provide sampling and analytical methods, as required by 40 CFR 265.93(d)(3)(ii) and OAC 3745-65-93(D)(3)(ii).

Response:

Sampling and analysis for RCRA assessment monitoring was discussed in the GQAPP even though specific sampling and analytical methods were not discussed.

Resolution:

Sampling and analytical methods are discussed in Sections 4.4 and 4.5 of Revision 1 of the GQAPP.