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RESPONSE TO U.S. EPA COMMENTS OPERABLE UNIT 5 - "INITIAL SCREENING OF ALTERNATIVES" REPORT ID-FMPC-0512-5

12/17/90

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RESPONSE TO U.S. EPA COMMENTS

OPERABLE UNIT 5 - "INITIAL SCREENING OF ALTERNATIVES" REPORT ID-FMPC-0512-5

1. GENERAL COMMENT

USEPA

COMMENT: **Response #3 states that U.S. DOE has transmitted a complete set of analytical results to U.S. EPA. This is not accurate. Complete analytical results from sampling of March 1989 and latter have not been submitted.**

RESPONSE: The data base is regularly updated with laboratory analytical results. Updated and modified data are sent quarterly to the following individuals:

1. Geotrans, Inc. (OEPA Subcontractor)
   Attention: Lisa August
2. PRC Environmental Management (U.S. EPA Subcontractor)
3. OEPA
   Attention: Graham Mitchell
4. DOE
   Attention: Dave Rast

Transmittal letters only are sent to Mr. Andy Avel, DOE and Ms. Catherine McCord, U.S. EPA. The last data update was transmitted in October 1990. The next transmittal will be in January 1991.

2. GENERAL COMMENT

USEPA

COMMENT: **Response #14 states that additional meteorological data was added to the text. No new data or any discussion of how site-specific information compares to Dayton or Cincinnati was presented in the revision.**

RESPONSE: Climatological data recorded at the Fernald site during 1989 indicate that the temperature for the site range from a minimum of -19.8 degrees F (-28.8 degrees C) on December 22, 1989 to a high of 92.1 degrees F (33.4 degrees C) on July 11, 1989). The prevailing winds at the 10-meter level of the

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FMPC tower during 1989 are from the southwest. Average monthly wind speeds at the site range from 7 mph in August to 11 mph in March. Because of problems measuring the precipitation during heavy rainstorms at the Fernald site, precipitation data is obtained from the Greater Cincinnati Airport. During 1989, the average annual precipitation, including melted snow, is 49.6 inches compared to the 30 year mean (1960-1989) of 40.6 inches. In addition, the average annual snowfall at the Cincinnati Airport during 1989 is 23.3 inches versus the 30 year mean (1960-1989) of 23.5 inches.

According to a study by IT (1986)[1], meteorological data recorded at the Cincinnati Airport are sufficiently representative to adequately reflect annual flow conditions at the Fernald Site. Other important factors are topographical considerations and the proximity of the FMPC to the Greater Cincinnati Airport. All of these factors favor similar meteorological conditions between the Fernald Site and Cincinnati Airport.

Previous meteorological studies conducted at the FMPC (Boback, et. al., 1985[2], Kornegay and Sharp, undated[3]) have used data from both the Greater Cincinnati and Dayton airports. The data indicates that wind roses from both locations are quite similar and the use of either station's wind speed, wind direction, and atmospheric stability data as input to a meteorological model

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[1]IT (International Technology Corp.) 1986, "Final Interim Report - Air, Soil, Water, and Health Risk Assessment in the Vicinity of the FMPC, Fernald, Ohio," Report and Data Package prepared for the U.S. Dept. of Energy in support of the Fernald litigation, Oak Ridge Operations Office, Oak Ridge, TN.

[2]Boback, M.W., et al., 1985, "History of FMPC Radionuclide Discharges," NLCO-2039, Feed Materials Production Center.

[3]Kornegay, F.C. and R.D. Sharpe, n.d., "Site Selection for Offsite Radiation Monitors at the Feed Materials Production Center Near Fernald, Ohio," Oak Ridge National Laboratory for the Oak Ridge Associated Universities.

produced similar results. No other formal studies have been conducted that compare meteorological data collected at the FMPC to data from Cincinnati and Dayton. However, a meteorologist from the Fernald Site indicates that it is approximately 2 to 3 degrees colder in Dayton and slightly greater in precipitation when compared to the meteorological conditions at the site.

3. GENERAL COMMENT

USEPA

COMMENT: **Response #25 is reasonable, but needs to be supported by subsequent sampling.**

RESPONSE: A complete listing for all of the total uranium results at Monitoring Well Numbers 2013, 3013, and 4013 is listed in Table 1. As shown in Well Number 2013, the concentrations of total uranium range from less than 1 ug/L to 8 ug/L, with 5 out of 7 results detected below the detection limit of 1 ug/L. A value of 36 ug/L was detected during the 4th round of sampling, but is a suspected outlier value because a duplicate sampling result (< 1 ug/L) shows 36 ug/L to be outside of the main group of data for this well. Total uranium sampling results for Monitoring Well Number 2013 after the suspected outlier value was detected are negligible from the second quarter quarter 1989 to the first quarter 1990.

The total uranium results for Monitoring Well Number 3013, presented in Table 1, range from 4 ug/L to 31.6 ug/L. A value of 490 ug/L was detected during the 4th round of sampling, but is a suspected outlier value because a duplicate sampling result (4 ug/L) shows 490 ug/L to be outside of the main group of data for this well. The suspected outlier is believed to be due to sampling problems. The concentrations of total uranium, detected before and after the suspected outlier (490 ug/L) in Sampling Round 4, do not indicate an increasing or decreasing trend in the concentration of uranium, but rather suggest a natural variation in the level of uranium during different sampling periods.

RESPONSE TO U.S. EPA COMMENTS
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As shown in Table 1 for Monitoring Well number 4013, the total uranium concentrations range from less than 1 ug/L to 5 ug/L during sampling period 4 through the 1st quarter of 1990. A value of 86 ug/L was detected during the 5th round of sampling, but is suspected of being an outlier value because it does not follow the historical trend of data for uranium detected at this well. Since the suspected outlier level was detected, subsequent sampling shows negligible concentrations of total uranium detected over three sampling periods (2nd quarter of 1989 to the 1st quarter 1990).

4. GENERAL COMMENT

USEPA

COMMENT: **Response #63 states that additional information would be included in the revised text to support the selection of ion exchange as the process option representative of this technology. While U.S. EPA support this position, no such information could be found in the revised ISA.**

RESPONSE: The support of the selection of ion exchange as the process option representative of this technology is as follows:

- When ion exchange is compared to the precipitation process, precipitation is characterized as a difficult, cumbersome and more expensive operation that requires complex chemical separation. This process precipitates most compounds out of solution resulting in a mixed hazardous waste. Disposal of this type of waste is costly and the disposal regulations are complex. Furthermore, the precipitation process is not adaptable to automatic control and most plants currently operate manually (EPA document 540/2-88/002 - Technical Approaches to the Cleanup of Radiologically Contaminated Superfund Sites).

- Ion exchange is a more attractive treatment process than reverse osmosis (RO) because RO costs more to operate over a 30 year treatment period.

- Ion exchange, compared to using biological exchange resins (biological/biosorbant process), is a more attractive process for removal of uranium from groundwater. The main disadvantage of the biological/biosorbant process is that this technology is still in the research and development stage. It is not accepted industry-wide and it has no institutional controls.

In summary, ion exchange is an easily implemented, proven, commercial technology. It has the lowest O&M costs over a 30 year treatment period and lowest overall costs when compared to precipitation, reverse osmosis and biological/biosorbant treatment processes for removing uranium from groundwater.

5. GENERAL COMMENT

USEPA

COMMENT: **Response #100 is not correct and does not reflect the approach that is being taken in the Remedial Investigation (RI). The fact that a contaminant was not initially identified as a suspect contaminant in the RI/FS Work Plan is not a justification for not addressing it now. The Work Plan recognized that there was many unknowns regarding characterization and that is why an expanded hazardous substance list (HSL) analysis was and still is being performed.**

RESPONSE: The original comment by OEPA stating that actinium-227 was discharged to the Great Miami River at approximately 200 percent of DOE's DCG was inaccurate. Based on results reported in the FMPC Environmental Monitoring Report for 1988 the average discharge was reported as $< 2.2 \times 10^1$. Based on this detection limit, the exact quantity discharged in 1988 is unknown and could have ranged from 0 to 22 pCi/L, and possibly below the standard of

10 pCi/L. The discharge of actinium-227 was again monitored in 1989 and reported average results indicate that the discharge is < 1.0 pCi/L. This average was calculated based on the results of 12 monthly composite samples.

TABLE 1

TOTAL URANIUM RESULTS FOR WELL NUMBERS 2013, 3013, AND 4013

Well Number	Total Uranium (ug/L)	Total Uranium, Duplicate Result (ug/L)	Sampling Round
2013	< 1	N/A	1
2013	< 1	N/A	2
2013	8	N/A	3
2013	< 1	36 (suspected outlier)	4
2013	< 1	N/A	2Q89
2013	< 1	N/A	4Q89
2013	2.18	N/A	W1Q90
3013	4	N/A	1
3013	4	N/A	2
3013	9.5	N/A	3
3013	4	490 (suspected outlier)	4
3013	12	N/A	2Q89
3013	5	N/A	4Q89
3013	31.6	N/A	W1Q90
4013	< 1	N/A	4
4013	86 (suspected outlier)	N/D	5
4013	3	N/A	2Q89
4013	5	N/A	4Q89
4013	4.59	N/A	W1Q90

N/A = Not Applicable
N/D = Not Done