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**SUPPLEMENT TO WORK PLAN ADDENDUM  
OPERABLE UNIT 5 OUTFALL LINE  
INVESTIGATION GROUNDWATER SAMPLING  
PROGRAM FINAL U.S. EPA AND OHIO EPA  
COMMENT RESOLUTION NOVEMBER 1993**

11/24/93

**DOE-FN/EPA  
40  
RESPONSES  
OU5**

SUPPLEMENT TO

WORK PLAN ADDENDUM

OPERABLE UNIT 5  
OUTFALL LINE INVESTIGATION  
GROUNDWATER SAMPLING PROGRAM

FINAL U.S. EPA AND OHIO EPA COMMENT RESOLUTION

November 1993

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
FERNALD, OHIO  
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

U.S. DEPARTMENT OF ENERGY  
FERNALD FIELD OFFICE

## INTRODUCTION

This Supplement to Work Plan Addendum for the Operable Unit 5 Outfall Line Investigation documents the resolution of issues and comments offered by U.S. EPA and Ohio EPA and incorporates amendments to the subject Plan, dated October 1992. All issues cited in the following documents have been resolved:

- U.S. EPA. Letter, J. A. Saric to J. R. Craig, "Disapproval of OU #5 Work Plan Addenda - Outfall Line Investigation," dated November 25, 1992
- Ohio EPA. Letter, G. E. Mitchell to J. R. Craig, "Comments on the Operable Unit 5 Work Plan Addendum," dated November 25, 1992.

The Supplement presents each comment followed by the resolution of the comment. Where a resolution requires a revision of a table, figure or text, the resolution is attached as an amendment.

Two appendices are attached to this resolution summary. Appendix A contains the two above-cited correspondences while Appendix B contains amendments to the Work Plan Addendum. Each amendment is identified by a code that refers to the Comment Number in the Supplement. For example, the code for an amendment recommended by U.S. EPA General Technical Comment No. 1 is USGTC-1, or one by Ohio EPA Specific Technical Comment No. 2 is OSTC-2, etc.



Table 1. Background Range and Analytical Results

	BACKGROUND RANGE <sup>a</sup>		2067	2119	2119
	MIN	MAX	105401	105621	105623
			11/17/92	1/28/93	4/5/93
INORGANICS	µg/L	µg/L	µg/L	µg/L	µg/L
ALUMINUM	60	182	-- <sup>o</sup>	--	na <sup>c</sup>
ANTIMONY	--	38	--	--	na
ARSENIC	2	550	--	--	na
BARIUM	6	789	56.8 B <sup>d</sup>	91.2 B	na
BERYLLIUM	1	2	--	--	na
CADMIUM	2	17	--	--	na
CALCIUM	1030	181000	101000	130000	na
CHROMIUM	10	560	--	--	na
CHROMIUM-6	--	50	--	--	na
COBALT	--	--	--	--	na
COPPER	10	270	--	--	na
CYANIDE	--	--	--	--	na
IRON	7	5500	1830	--	na
LEAD	3	140	--	--	na
MAGNESIUM	500	46500	26100	41100	na
MANGANESE	2	897	150	195	na
MERCURY	0.2	3.1	--	--	na
MOLYBDENUM	4	40	--	--	na
NICKEL	12	780	--	--	na
POTASSIUM	664	13500	1910	2540 B	na
SELENIUM	2	6	--	--	na
SILICON	2000	6140	4930	5890	na
SILVER	10	110	--	--	na
SODIUM	610	55000	7850	12100	na
VANADIUM	10	25	--	--	na
ZINC	9	3000	11.7 B	--	na

GEN CHEM	mg/L	mg/L	mg/L	mg/L	mg/L
ALKALINITY	--	383	259	372.5	365
AMMONIA	0.1	12.6	--	0.122	<0.1
CHLORIDE	0.02	120	17.23	26.33	24.6
FLUORIDE	0.05	1.9	0.17	0.19	0.16
NITRATE	0.014	24.9	--	5.25	6.06
PHOSPHOROUS	0.01	3.08	--	0.06	0.02
SULFATE	2.79	321	83.8	109.3	101.5
SULFIDE	0.001	30.4	--	0.5	0.75
TOC	--	--	1.3	1.44	<1
TON	--	--	0.14	0.028	<0.1

Table 1. Background Range and Analytical Results (continued)

RADIONUCLIDES	BACKGROUND RANGE <sup>e</sup>		2067	2119	2119
	pCi/L	pCi/L	105401 11/17/92	105621 1/28/93	105623 4/5/93
CS-137	--	--	< 20	< 20	< 20
NP-237	--	--	< 1	< 1	< 1
PU-238	--	--	< 1	< 1	< 1
PU-239/240	--	--	< 1	< 1	< 1
RA-226	1.1	8.5	< 1	< 1	< 1
RA-228	3.1	5.5	< 3	< 3	< 3
RU-106	--	--	< 150	< 150	< 150
SR-90	--	--	< 5	< 5	< 5
TC-99	--	36	< 30	< 30	< 30
TH-228	1.2	2.9	--	--	--
TH-230	1.2	3.44	--	--	--
TH-232	--	--	--	--	--
TH-TOTAL	2	6.14	--	--	--
U-234	1.2	4.2	< 1	< 1	< 1
U-235/236	--	--	< 1	< 1	< 1
U-238	0.9	4.4	< 1	< 1	< 1
U-TOTAL	0.8	3.13	< 1.0 (µg/l)	< 5	< 5
GROSS ALPHA	--	--	< 6.1	< 5.4	< 5.4
GROSS BETA	--	--	< 4.4	9.75	8.4
Background Range <sup>f</sup>					
ORGANICS	µg/L	µg/L	µg/L	µg/L	µg/L
ACETONE		6 J	3 BJ <sup>g</sup>	--	na
BENZENE		2 J	--	--	na
C DISULFIDE		3 J	--	--	na
CHLOROBENZENE		2 J	--	--	na
DCE, 11-		2 J	--	--	na
TOLUENE		3 J	--	--	na
BIS-2-EHP		3 J	--	--	na

<sup>a</sup> Table 14 Summary Statistics of Inorganic Constituents for Background Groundwater Monitoring Wells in the Great Miami Aquifer, Characterization of Background Water Quality for Streams and Groundwater, DOE 1993.

<sup>b</sup> -- Means not detected

<sup>c</sup> na Indicates not analyzed.

<sup>d</sup> B Indicates analyte was also found in the blank.

<sup>e</sup> Table 9 Summary Statistics of Radionuclide Data and Table 10 Summary Statistics of Total Uranium Data for Background Groundwater Monitoring Wells in the Great Miami Aquifer, Characterization of Background Water Quality for Streams and Groundwater, DOE 1993.

<sup>f</sup> Table 15 Organic Compounds Detected in Great Miami Aquifer Background Wells, Characterization of Background Water Quality for Streams and Groundwater, DOE 1993.

<sup>g</sup> J Indicates an estimated value.





2091, 2097 and 2098. Average yearly groundwater elevations in those wells range from 512 to 521 feet above mean sea level (MSL). In addition, the average water level measured in Monitoring Well 2119 since February 1993 is 520 feet above MSL. The bottom depth measurements of the pipeline at Manhole 179 and Manhole 180 are 564 feet 530 above MSL respectively and the pipeline elevation decreases slightly between Manhole 180 and the river. Comparing the elevation of the pipe at Manhole 180 and the water table at Well 2119, it is evident that the pipe is approximately 10 feet above the average water table at that location.

Commenting Organization: U.S. EPA  
Section #: 2.1  
Specific Technical Comment # 3

Pg. #: 2  
Commentor:  
Line #:

Code:

Comment: DOE discusses the Outfall Line and its failure here. DOE notes that the Outfall Line failed at pipe junctions in several locations; DOE also states that the time of the failure is unknown. Several issues should be discussed and investigated. First, the exact location of the failures should be identified. Second, the possible volume released to surrounding soils from the Outfall Line should be discussed. Third, the construction details of the Outfall Line should be discussed in more detail. DOE should present this information and provide an approach to adequately investigate possible releases in the areas of Outfall Line failure.

Resolution: Revision of the Work Plan Addendum is not required. The Outfall Line consists of a 16-inch-diameter cast-iron gravity-flow pipeline extending a distance of 4,650 feet from the southeast portion of the Production Area to the Great Miami River. The Outfall Line was buried in the 4- to 6-foot range below ground surface in 1952. However, natural erosion processes and soil subsidence may have altered the depth at which the line is currently buried. Exact locations of the possible failures between Manholes 179 and 180 are unknown. Video inspection of this section indicated several apparently dislocated joints which appeared to have one-quarter to three-eighths-inch gaps between pipe sections.

Although the video showed possible leaks, it is not possible to estimate, with any degree of accuracy, how much material may have passed through the joints over any given period. An attempt to estimate the leak rate or concentration would be without sound basis and of little benefit to the investigation. As discussed in the response to U.S. EPA General Technical Comment # 1, Monitoring Well 2119 has been located to determine if the potentially leaking section of the Outfall Line has contaminated the Great Miami Aquifer.

Commenting Organization: U.S. EPA  
Section #: 3.0  
Specific Technical Comment # 4

Pg. #: 3  
Commentor:  
Line #:

Code:

Comment: DOE discusses the relationship of water level to possible contamination in the vadose zone and postulates that changing static water level may have desorbed contamination and resulted in the contamination of well 2067. Well 2067 is over 1,000 feet upgradient of the Outfall Line failure; DOE does not present a viable transport mechanism to explain

the migration of contaminants 1,000 feet upgradient. DOE should discuss the more likely potential sources of contamination of well 2067, such as the Sewage Treatment Plant Incinerator and the Production Area, and propose an adequate investigation of these sources.

Resolution: DOE agrees with the comment. Contamination in Well 2067 is not thought to have originated from the Outfall Line failure area. More likely sources include the Production Area and the Sewage Treatment Plant. DOE initially presented the possibility that contamination from the pipeline may have desorbed to unsaturated soil as a very environmentally conservative postulate. However, this idea is not germane to assessment of the pipeline. As indicated in the resolution of U.S. EPA Specific Technical Comment No. 1, a more thorough interpretation of the Well 2067 area will be presented in the OU5 RI Report.

Commenting Organization: U.S. EPA  
Section #: 4.1  
Specific Technical Comment # 5

Pg. #: 5

Commentor:  
Line #:

Code:

Comment: DOE proposes investigating the possible releases from the Outfall Line using Hydropunch to vertically profile at one sampling location and then install a well. There are several problems with this approach. First, installing one well to investigate release from several potential failure locations is inadequate. Second, the approach does not adequately investigate possible soil contamination. Third, because the time of release is unknown, it is likely that groundwater contamination may have migrated some distance from the source. DOE must propose an investigation that adequately evaluates the soil and groundwater in the area of line failure and investigates the area downgradient of these line failures.

Resolution: Revision of the Work Plan Addendum is not required. DOE does not agree with all of the comment statements. The location of Well 2119 was proposed directly downgradient of the potentially leaking segment of the Outfall Line. Between Manhole 179 and 180, the Outfall Line runs from west to east/southeast. Groundwater gradients in the area are from west to east; therefore, Well 2119 was positioned in the location most likely to detect any significant leak from the Outfall Line. Samples collected from private wells and from the gravel pit to the north and east of Manhole 180 have not indicated that any groundwater contamination existed in the area.

It is agreed that more investigation may be needed in the immediate area of the suspected failures. Soil samples will be collected in the suspected failure areas, between Manhole 179 and 180, when the pipeline is removed. As stated in the response to General Technical Comment # 4, soil sampling is difficult at this location because of the slope between Manholes 179 and 180 formed by the steep river terrace scarp. Given the steepness of the slope and the burial depth of the pipe, it is unlikely that a boring program could be conducted that would accurately determine if soil contamination is present.

Since the time of a release was not known, the investigation was designed to start close to the possible source, which is why Well 2119 was located near Manhole 180. If the data from the installation and sampling of Well 2119 were to indicate the presence of a

plume. further investigation would be considered. Neither soil nor Hydropunch sample data from installation of the well indicated the presence of significant uranium contamination. Analytical data from groundwater samples collected from Well 2119 also did not detect uranium, as is shown in Table 1.

Commenting Organization: U.S. EPA  
Section #: 4.1  
Specific Technical Comment # 6  
Pg. #: 7  
Commentor:  
Line #:  
Code:

Comment: DOE proposes to conduct a vertical profile of groundwater contamination at one location to evaluate the vertical distribution of uranium concentration. EPA notes the approach does not assure adequate evaluation of the horizontal extent of contamination, which is necessary information before the vertical distribution is evaluated. If a vertical profile is conducted at the proposed location, the central portion of the plume may not be encountered. DOE does not know the location of the plume, if it exists. Once the plume is horizontally characterized by profiling, a vertical profile conducted within the central portion of the plume may provide valuable information on possible contaminant sources.

Resolution: Revision of the Work Plan Addendum is not required. The first task was to determine whether groundwater contamination is present. The vertical profile generated by the Hydropunch sampling was used to determine the depth of the suspected plume in case it is deeper in the groundwater system than would be detected with a standard 2000-series monitoring well. Hydropunch samples did not detect elevated levels of uranium.

Once installed, Monitoring Well 2119 was to be used to monitor groundwater for contamination in the area immediately downgradient of the section of the Outfall Line that failed pneumatic testing. If uranium levels in excess of 20 µg/L were detected at Well 2119, further Hydropunch investigation would be initiated to determine the horizontal and vertical extent of contamination. Analytical data from the two groundwater samples collected from Well 2119 did not detect uranium.

Commenting Organization: Ohio EPA  
Section #:  
General Technical Comment # 1  
Pg. #:  
Commentor:  
Line #:  
Code:

Comment: From the limited work proposed within the addendum it is unclear how DOE intends to characterize the contamination and its source. The installation of one monitoring well will not determine whether the outfall line or "a plume moving east from the Production Area" is the source.

Resolution: DOE agrees with the comment. Monitoring Wells 2120, 2171, 2417 and 2420, which are located east of the Production Area, will be used to determine the extent of the presumed plume from the former Production Area. Monitoring Wells 2429 and 3429 are downgradient wells for the detection of possible groundwater contamination originating from the Sewage Treatment Plant. If either Well 2429 or Well 3429 detects contamination above 20 µg/L, installation of additional wells to the east will be

considered. Well 2119 was used to determine if the potentially leaky section of the Outfall Line has contaminated the Great Miami Aquifer. As shown in Table 1, analytical data from the two groundwater samples collected to date did not detect significant uranium concentrations. Amendment USGTC-2 presents total uranium results through 1992 for Wells 2067, 2120, 2171, 2420 and 2430, which are located east of the Production Area. Amendment OSTC-9 shows the location of these wells.

Commenting Organization: Ohio EPA  
Section #: Pg. #: Commentor: Line #: Code:  
General Technical Comment # 2

Comment: DOE should expand the scope of the investigation via the use of more hydropunching and/or the installation of additional piezometers and/or monitoring wells. DOE should attempt to answer the existing data gaps during this investigation and not put them off, potentially delaying the RI.

Resolution: Revision of the Work Plan Addendum is not required. DOE does not agree that existing data gaps are being put off. A significant expansion in the scope of investigation is not recommended until a need is definitively identified. Monitoring Well 2119 is located specifically to monitor the Great Miami Aquifer for contaminants possibly emanating from a localized area of the Outfall Line. Data from Well 2119 indicate that the potentially leaky section of the Outfall Line has not contaminated the aquifer. In addition, contamination near Well 2067 will be evaluated using data from existing wells and newly installed RCRA wells as described in response to Ohio EPA General Technical Comment # 1. Ongoing monitoring of the following RCRA perimeter wells, which are upgradient of the section of the Outfall Line between Manholes 179 and 180, will be conducted through the RCRA Program:

2424	4426	2430
3424	2417	2431
4424	3417	3431
31217	2429	2432
41217	3429	3432
2051	2067	4432
2426	3067	
3426	4067	

Commenting Organization: Ohio EPA  
Section #: Pg. #: Commentor: Line #: Code:  
General Technical Comment # 3

Comment: It is not clear whether all available data have been incorporated into this work plan. Data from the STP Incinerator Soils RA and the EWMF Sampling Plan should be reviewed for additional information. Additionally, the RCRA program had proposed some perimeter wells in the area of the STP, which should be reviewed.

Resolution: It is acknowledged that not all available data were included. Amendment USGTC-2 presents recent data from the existing Well 2067 and Wells 2120, 2171, 2420 and 2430, which are located east of the Production Area and used to determine the extent of the presumed plume from the former Production Area. RCRA Wells 2429 and 3429 will serve as downgradient wells for the Sewage Treatment Plant. These were sampled on September 21, 1993 and the data are not yet available. If contamination is detected in Monitoring Well 2429 or 3429, further investigation will be considered. STP soil RA data and data from the EWMF are being reviewed in support of the OU5 RI report. Neither of these investigations contributed to the groundwater data for the subject area.

Commenting Organization: Ohio EPA  
Section #: 2.0  
Specific Technical Comment # 1  
Pg. #: 3  
Commentor:  
Line #:  
Code:

Comment: Figure 1. The figure is hard to read and should be larger providing more detail as to the location of the STP and any additional monitoring wells.

Resolution: DOE agrees with the comment. Figure 1 is revised to provide additional detail illustrating the position of the Sewage Treatment Plant and the Outfall Line. Figure 3 is revised to illustrate locations of all monitoring wells pertinent to the assessment of the Outfall Line. Amendment OSTC-1 presents revised Figure 1; Amendment OSTC-9 presents revised Figure 3.

Commenting Organization: Ohio EPA  
Section #: 1.0  
Specific Technical Comment # 2  
Pg. #: 1  
Commentor:  
Line #:  
Code:

Comment: Page 1, Paragraph 2: It should be more appropriate for DOE to assign the value of .5 ppb to the BDL's instead of 0.

Resolution: DOE agrees. The second paragraph of Section 1.0 is revised to assign a value of 0.5 ppm for BDL when calculating the average of 13 readings; the recalculated average is 2.7 µg/L. A revised average, using the values presented in USGTC-2, is 5.9 µg/L.

Commenting Organization: Ohio EPA  
Section #: 3.0  
Specific Technical Comment # 3  
Pg. #: 2  
Commentor:  
Line #:  
Code:

Comment: Section 3.0: DOE fails to state whether monitoring well 2067 has been sampled for anything other than total uranium. If the well has not been sampled for full HSL and Rads, then such sampling must be included in this work plan.

Resolution: Revision of the Work Plan Addendum is not required. Monitoring Well 2067 was sampled in 1993 for a full HSL, full radiological and general groundwater quality parameters.



hydropunch samples collected were all at background levels. Amendment OSTC-7 presents a table of total uranium concentrations detected in the Hydropunch samples. Since the Hydropunch samples did not detect any evidence of a plume, the well was installed as a standard 2000-series well. Ten of the 15 feet of screen extend below the water table.

The need for definition of the lateral extent of a suspected plume is not necessary until it is confirmed that a plume exists. Additional Hydropunch sampling will only be necessary if significant groundwater contamination, such as total uranium greater than 20 µg/L, is found in Well 2119. Groundwater sample data from Well 2119 did not indicate the presence of uranium contamination.

Commenting Organization: Ohio EPA  
Section #: 3.0  
Specific Technical Comment # 8  
Pg. #: 5  
Commentor:  
Line #:  
Code:

Comment: Page 5, Paragraph 3: This paragraph indicates that groundwater flow is exclusively west to east; however, the Revised Work Plan addendum for additional monitoring wells for OU5 (November 20, 1992) indicates that the groundwater flow is east to west near the Great Miami River. This should be clarified.

Resolution: Revision of the Work Plan Addendum is not required. The statement in paragraph 3 refers to average conditions interpreted from water level data collected by the Miami Conservancy District in 1986 and 1988. Maps presenting this data indicate water levels in wells which are located near the Southwestern Ohio Water Company (SOWC) collector wells and not available to the FEMP for routine monitoring. Water level data collected from FEMP RI wells installed since 1987 show that the gradient is to the east or slightly to the northeast in the vicinity of Well 2067.

It is unclear where the apparent contradictory statement is in "Work Plan Addendum for Additional Wells," as revised in November 1992. On page 13 (under the discussion of the area east of Plant 6) the second paragraph states: "the net direction of travel is also to the east-northeast because of the influence of the collector wells along the Great Miami River." This is consistent with the statement in the Outfall Line Investigation Groundwater Sampling Program.

Commenting Organization: Ohio EPA  
Section #: 4.1  
Specific Technical Comment # 9  
Pg. #: 5  
Commentor:  
Line #:  
Code:

Comment: Page 5, Paragraph 5: This monitoring well will not be down gradient in times of flow reversal.

Resolution: Revision of the Work Plan Addendum is not required. DOE agrees; however, the frequency of such a reversal appears to be very low and of short duration. DOE has monitored monthly groundwater levels under the RI since January 1988. During this time, the influence of the SOWC collector wells has sustained a net draw down in the

area of the Great Miami River except for one to two months in the spring of very wet years, when the river is flowing at its annual maximum.

Monitoring Well 2097 is within 800 to 1000 feet of the Great Miami River and within the cone of depression created by the SOWC collector wells as depicted in the Miami Conservancy District data. Water level data from Well 2097 have been collected since November 1988. These data show that the water level in Well 2097 is consistently lower than in Well 2067 to the west except for one to two months in the spring of 1989, 1990 and 1993. Similarly, the water level in Well 2097 is lower than the level in Well 2091 to the south and Well 2051 to the northwest, for all months except one to two months in the spring of wetter years. Well 2119 is near the center of the area bounded by these wells. Amendment OSTC-9 presents a revised Figure 3 to show locations of monitoring wells in the subject area.

Commenting Organization: Ohio EPA	Commentor:
Section #: 4.1	Pg. #: 5
Specific Technical Comment # 10	Line #: _____
	Code:

Comment: Page 5, Paragraph 5: The DOE should identify the wells to be used for the upgradient comparison.

Resolution: Virtually all of the perimeter monitoring wells installed along the east perimeter of the FEMP, along with Well 2091 to the south and Well 2098 to the north, will provide local data on the upgradient side of Well 2119. Amendment OSTC-9 includes revised Figure 3 which presents locations of those wells.

Commenting Organization: Ohio EPA	Commentor:
Section #: 4.1	Pg. #: 5
Specific Technical Comment # 11	Line #: _____
	Code:

Comment: Page 5, Paragraph 5: The DOE does not give sufficient justification for the installation of a single monitoring well. If flow directions in this area shift, then it would be prudent to install more than one monitoring well.

Resolution: Revision of the Work Plan Addendum is not required. The intent of the investigation is to detect contamination resulting from possible leakage in the Outfall Line, and Monitoring Well 2119 is located in an optimum position to detect such contamination. Groundwater direction and flow reversals were considered in locating Well 2119. No significant contamination has been detected in that well to date.

**APPENDIX A**

**APPENDIX A**

**A-1**

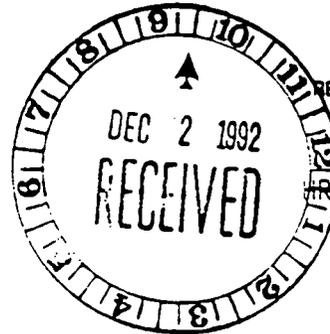


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 REGION 5  
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-4928

NOV 25 1992

Mr. Jack R. Craig  
 United States Department of Energy  
 Feed Materials Production Center  
 P.O. Box 398705  
 Cincinnati, Ohio 45239-8705



REPLY TO THE ATTENTION OF:

FE-8J

RE: Disapproval of OU #5 Work Plan  
 Addenda-Outfall Line  
 Investigation

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Operable Unit (OU) 5 Remedial Investigation (RI)/Feasibility Study (FS) Work Plan Addenda, Outfall Line Investigation. The Addenda proposed additional groundwater characterization adjacent to the Outfall line between Manholes 179 and 180. The Addenda fails to adequately address contamination originating from the outfall line or from other potential sources in the area.

U.S. EPA hereby disapproves the Work Plan Addenda pending incorporation of the attached comments.

Please contact me at (312/FTS) 886-3992 if you have any questions.

Sincerely,

James A. Saric  
 Remedial Project Manager

Enclosure

cc: Graham Mitchell, CEPA-SWDC  
 Pat Whitfield, D.O. OCE-100  
 Dennis Carr, AMCC

0018

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY WORK PLAN ADDENDUM FOR THE  
OPERABLE UNIT 5 OUTFALL LINE INVESTIGATION, GROUND-WATER SAMPLING PROGRAM

GENERAL TECHNICAL COMMENTS

1. The U.S. Department of Energy (DOE) has proposed installing one well based on the results of a vertical aquifer profiling study. The vertical aquifer profiling study is intended to evaluate potential ground-water contamination associated with the failure of the Outfall Line. Using one well to evaluate leakage from the section of the Outfall Line between Manholes 179 and 180, which is about 500 feet long is inadequate. It would be more appropriate to use a phased approach; first the presence of contamination near the suspected source should be evaluated; then the extent of contamination should be evaluated if a source is identified. Because no wells have been installed in this area, DOE should either consider installing a series of downgradient wells or use the Hydropunch to collect samples along the pipeline, downgradient of the area of suspected release and transverse to the principal direction of ground-water flow. If contamination is identified, further investigation should be conducted.
  
2. DOE has identified ground-water contamination at Well 2067. The two most recently collected samples indicate a trend of increasing uranium concentration. At least two potential sources of contamination should be investigated: (1) the production area and (2) the Sewage Treatment Plant Incinerator. The current approach will not adequately investigate these potential sources. In addition, the current approach does not adequately investigate the nature and the extent of the contaminant plume. These deficiencies result in a significant data gap considering the limited well coverage in this portion of Operable Unit (OU) 5. DOE must address these data gaps in the revised work plan addendum.

- 3. DOE conducted an investigation of the Outfall Line in July 1990. EPA had comments on data gaps for that study. While the study found that the section of the Outfall Line failed in the area between Manhole 179 and Manhole 180, DOE conducted no sampling in this area. Considering the fact that no sampling has been conducted in this area, the current study should include subsurface soil and ground-water sampling in the areas where the Outfall Line failed.

**SPECIFIC TECHNICAL COMMENTS**

- 1. Section 1.0, Page 1, Paragraph 2. DOE averages the results from thirteen samples consisting of two samples with elevated uranium concentrations and eleven samples in which uranium was not detected. The average concentration of uranium is not significant; what is important is that a trend of increasing concentration is apparent. Eleven rounds with no uranium detected was followed by two successive samples containing increasing concentrations of uranium. This trend suggests that the leading edge of a contaminant plume may have reached Well 2067. DOE should discuss the trend of increasing uranium concentration and its relevance to the proposed investigation.
- 2. Section 2.0, Page 2, Paragraph 2. DOE correlates the elevation of the Outfall Line with the Great Miami River. The purpose of this discussion is to identify potential factors contributing to failure of the Outfall Line. Although this may be important, DOE should also discuss the relative elevation of ground water to the base elevation of the Outfall Line. This information is critical in evaluating the migration pathway to ground water from the Outfall Line.
- 3. Section 2.1, Page 2, Paragraph 3. DOE discusses the Outfall Line and its failure here. DOE notes that the Outfall Line failed at pipe junctions in several locations; DOE also states that the time of the failure is unknown. Several issues should be discussed and investigated. First, the exact location of the failures should be identified. Second, the possible volume released to surrounding soils

from the Outfall Line should be discussed. Third, the construction details of the Outfall Line should be discussed in more detail. DOE should present this information and provide an approach to adequately investigate possible releases in the areas of Outfall Line failure.

4. Section 3.0, Page 5, Paragraph 1. DOE discusses the relationship of water level to possible contamination in the vadose zone and postulates that changing static water level may have desorbed contamination and resulted in the contamination of Well 2067. Well 2067 is over 1,000 feet upgradient of the Outfall Line failure; DOE does not present a viable transport mechanism to explain the migration of contaminants 1,000 feet upgradient. DOE should discuss the more likely potential sources of contamination of Well 2067, such as the Sewage Treatment Plant Incinerator and the production area, and propose an adequate investigation of these sources.
5. Section 4.1, Page 5, Paragraph 5 DOE proposes investigating the possible releases from the Outfall Line using the Hydropunch to vertically profile at one sampling location and then install a well. There are several problems shortcomings with this approach. First, installing one well to investigate release from several potential failure locations is inadequate. Second, the approach does not adequately investigate possible soil contamination. Third, because the time of release is unknown, it is likely that ground-water contamination may have migrated some distance from the source. DOE must propose an investigation that adequately evaluates the soil and ground water in the area of line failure and investigates the area downgradient of these line failures.
6. Section 4.1, Page 7, Paragraph 3 DOE proposes to conduct a vertical profile of ground-water contamination at one location to evaluate the vertical distribution of uranium concentration. EPA notes the approach does not assure adequate evaluation of the horizontal extent of contamination, which is necessary information before the vertical distribution is evaluated. If a vertical profile is conducted at the

proposed location, the central portion of the plume may not be encountered. DOE does not know the location of the plume, if it exists. Once the plume is horizontally characterized by profiling, a vertical profile conducted within the central portion of the plume may provide valuable information on possible contaminant sources.

**APPENDIX A**

**A-2**

**Southwest District Office**

40 South Main Street  
Dayton, Ohio 45402-2086  
(513) 285-6357  
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George  
Governor

November 25, 1992

Mr. Jack R. Craig  
Project Manager  
U.S. DOE FEMP  
P.O. Box 398705  
Cincinnati, Ohio 45239

Dear Mr. Craig:

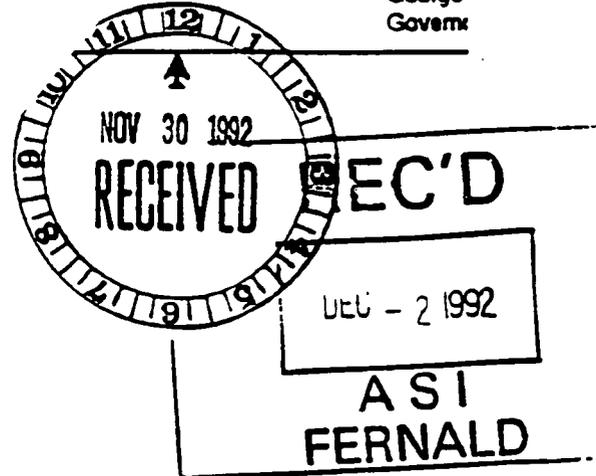
Listed below are Ohio EPA comments on the O.U. 5 Work Plan Addendum for the Outfall Line:

General Comments

1. From the limited work proposed within the addendum it is unclear how DOE intends to characterize the contamination and its source. The installation of one monitoring well will not determine whether the outfall line or "a plume moving east from the production area" is the source.
2. DOE should expand the scope of the investigation via the use of more hydropunching and/or the installation of additional piezometers and/or monitoring wells. DOE should attempt to answer the existing data gaps during this investigation and not put them off, potentially delaying the RI.
3. It is not clear whether all available data have been incorporated into this work plan. Data from the STP Incinerator Soils RA and the EWMF Sampling Plan should be reviewed for additional information. Additionally, the RCRA program had proposed some perimeter wells in the area of the STP, which should be reviewed.

Specific Comments

1. Figure 1: The figure is hard to read and should be larger providing more detail as to the location of the STP and any additional monitoring wells.
2. Page 1, Paragraph 2: It should be more appropriate for DOE to assign the value of .5 ppb to the BDL's instead of 0.



Mr. Jack R. Craig  
U.S. DOE FEMP  
November 25, 1992  
Page Two

3. Section 3.0: DOE fails to state whether monitoring well 2067 has been sampled for anything other than total uranium. If the well has not been sampled for full HSL and Rads, then such sampling must be included in this work plan.
4. Section 4.0: If monitoring well 2067 is being sampled quarterly, DOE must include data more recent than 1990. Almost two years of additional data should be available for both water levels and contaminants.
5. Section 4.1: Two Section 4.1's exist. Please correct.
6. Section 4.1: DOE should consider the installation of piezometers for the determination of ground water flow direction as well as sampling for total uranium and other radionuclides.
7. Section 4.1: a) DOE should discuss the expected total depth of the boring and the expected depth of the monitoring well screen. b) DOE should expand the scope of hydropunching to determine the areal extent of contamination.
8. Page 5, Paragraph 3: This paragraph indicates that ground water flow is exclusively west to east; however, the Revised Work Plan addendum for additional monitoring wells for OU5 (November 20, 1992) indicates that the ground water flow is east to west near the Great Miami River. This should be clarified.
9. Page 5, Paragraph 5: This monitoring well will not be down gradient in times of flow reversal. (See Comment #8)
10. Page 5, Paragraph 5: The DOE should identify the wells to be used for the upgradient comparison.
11. Page 5, Paragraph 5: The DOE does not give sufficient justification for the installation of a single monitoring well. If flow directions in this area shift, then it would be prudent to install more than one monitoring well.

Mr. Jack R. Craig  
U.S. DOE FEMP  
November 25, 1992  
Page Three

If you have any questions about these comments, please contact Tom Schneider or me.

Sincerely,



Graham E. Mitchell  
Project Manager

GEM/acp

cc: Jenifer Kwasniewski, DERR, CO  
Tom Schneider, DERR, SWDO  
Jim Saric, U.S. EPA  
Dennis Carr, WEMCO  
Lisa August, GeoTrans  
Tom Hahne, PRC  
Robert Owen, ODH

APPENDIX B

**APPENDIX B**

**USGTC-2**

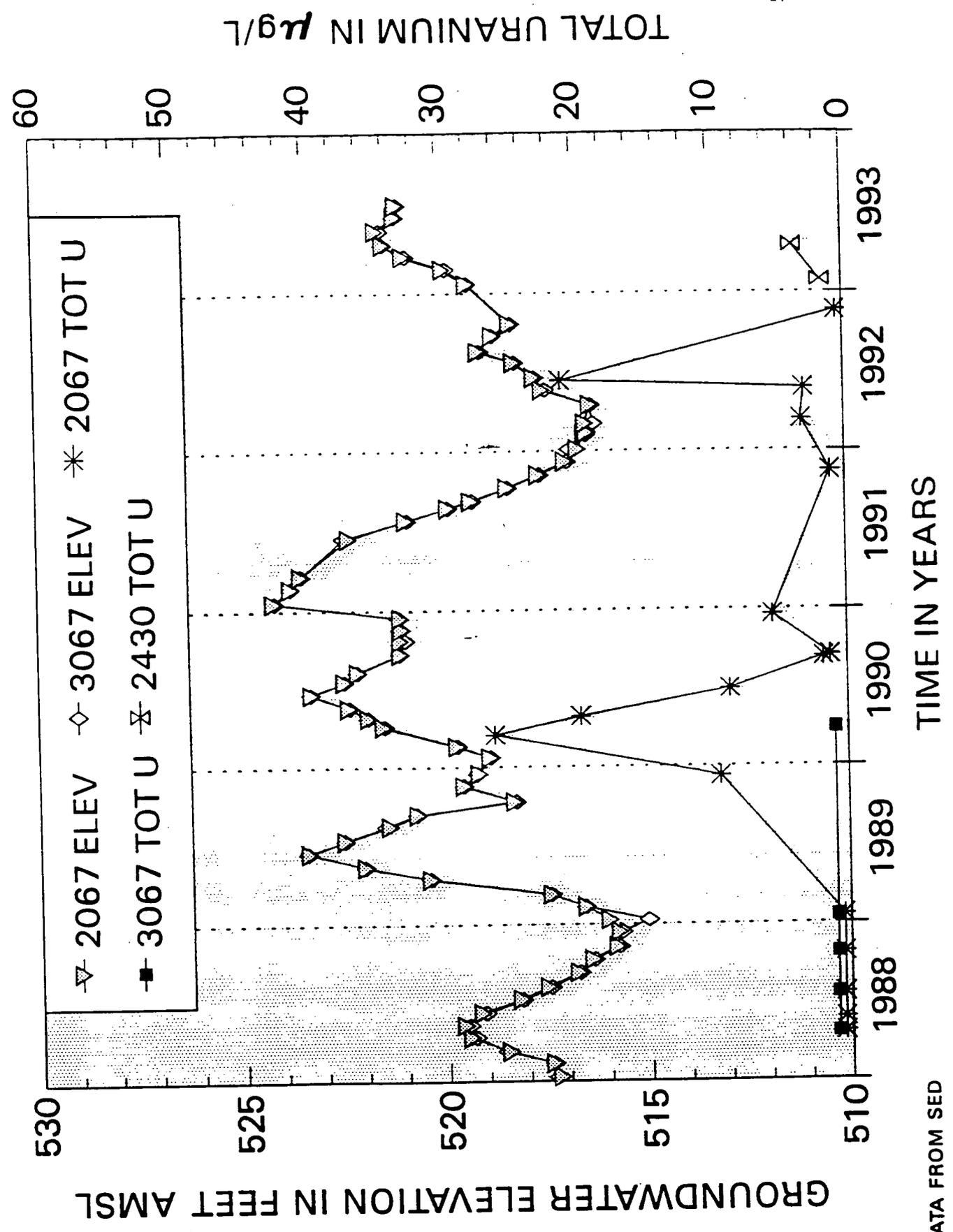
TOTAL URANIUM (ug/L)					
DATE	2067	2120	2171	2420	2430
04/21/88	0.5				
05/24/88	0.5				
07/21/88	0.5				
10/24/88	0.5				
01/19/89	0.5				
12/07/89	9.66				
03/14/90	26.3				
04/26/90	19.9				
06/28/90	10.1				
06/28/90	6.7				
06/28/90	9.8				
09/09/90	1.8				
09/13/90	1.3				
12/17/90	5.3				
12/17/90	5.9				
11/13/91	1.1				
11/13/91	1.1				
01/04/92				7.0	
02/04/92 *				9.7	
02/04/92				5.7	
02/05/92		11.5			
02/10/92	3.2				
02/25/92			<1.0		
04/01/92				13.0	
04/22/92	3.0				
04/28/92			0.8		
05/11/92	21.0				
05/13/92		9.4			
07/15/92				1.0	
11/17/92	0.5				
01/25/93					1.6
04/15/93					3.6
04/15/93					3.8

\* - Analyzed by WEMCO laboratory

**APPENDIX B**

**USSTC-1**

FIGURE 2



GROUNDWATER ELEVATION IN FEET AMSL

TOTAL URANIUM IN µg/L

530

525

520

515

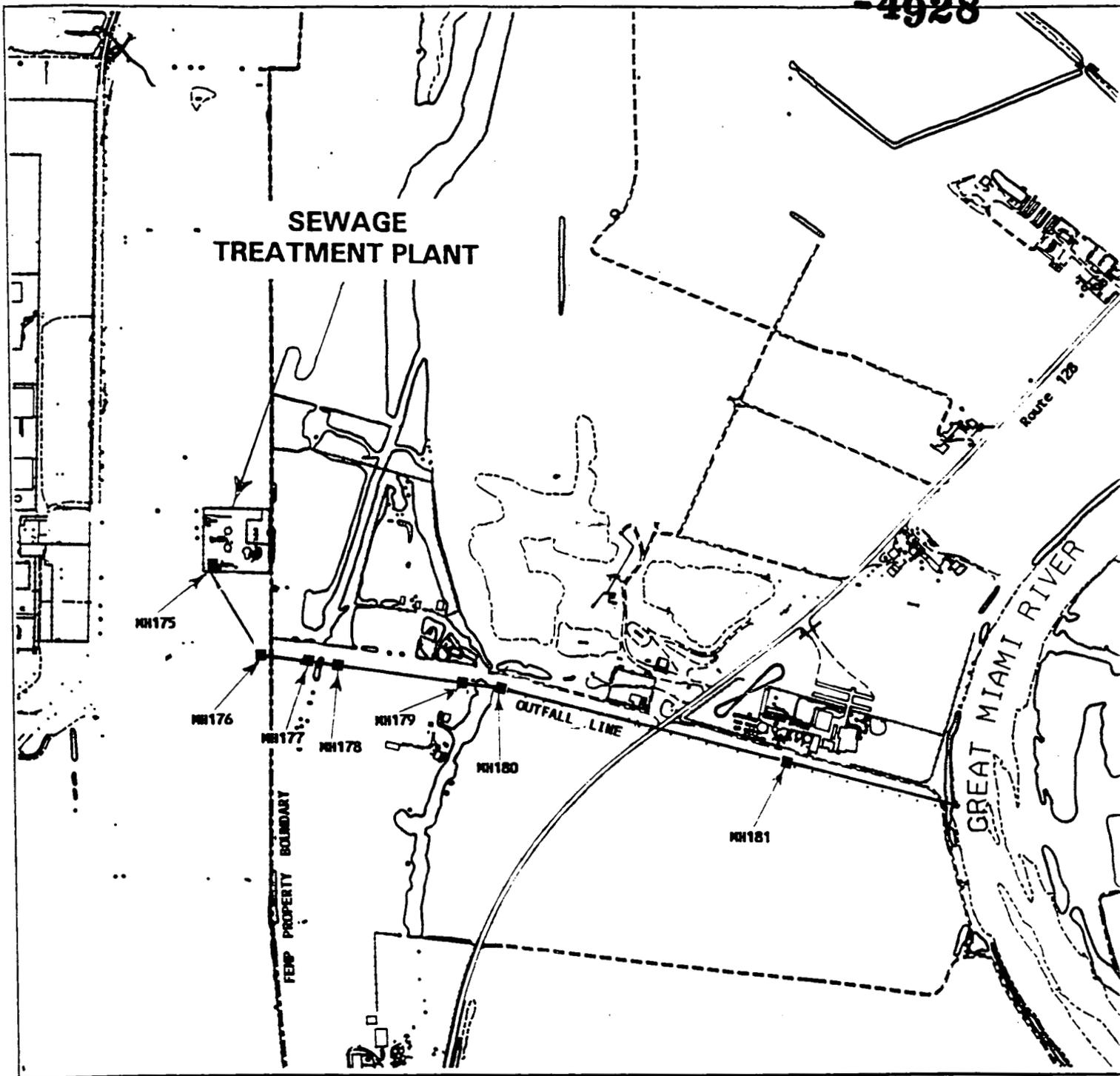
510

1300

DATA FROM SED

**APPENDIX B**

**OSTC-1**



FMPC EFFLUENT LINE LOCATION MAP



FIGURE 1

4928

**APPENDIX B**

**OSTC-7**

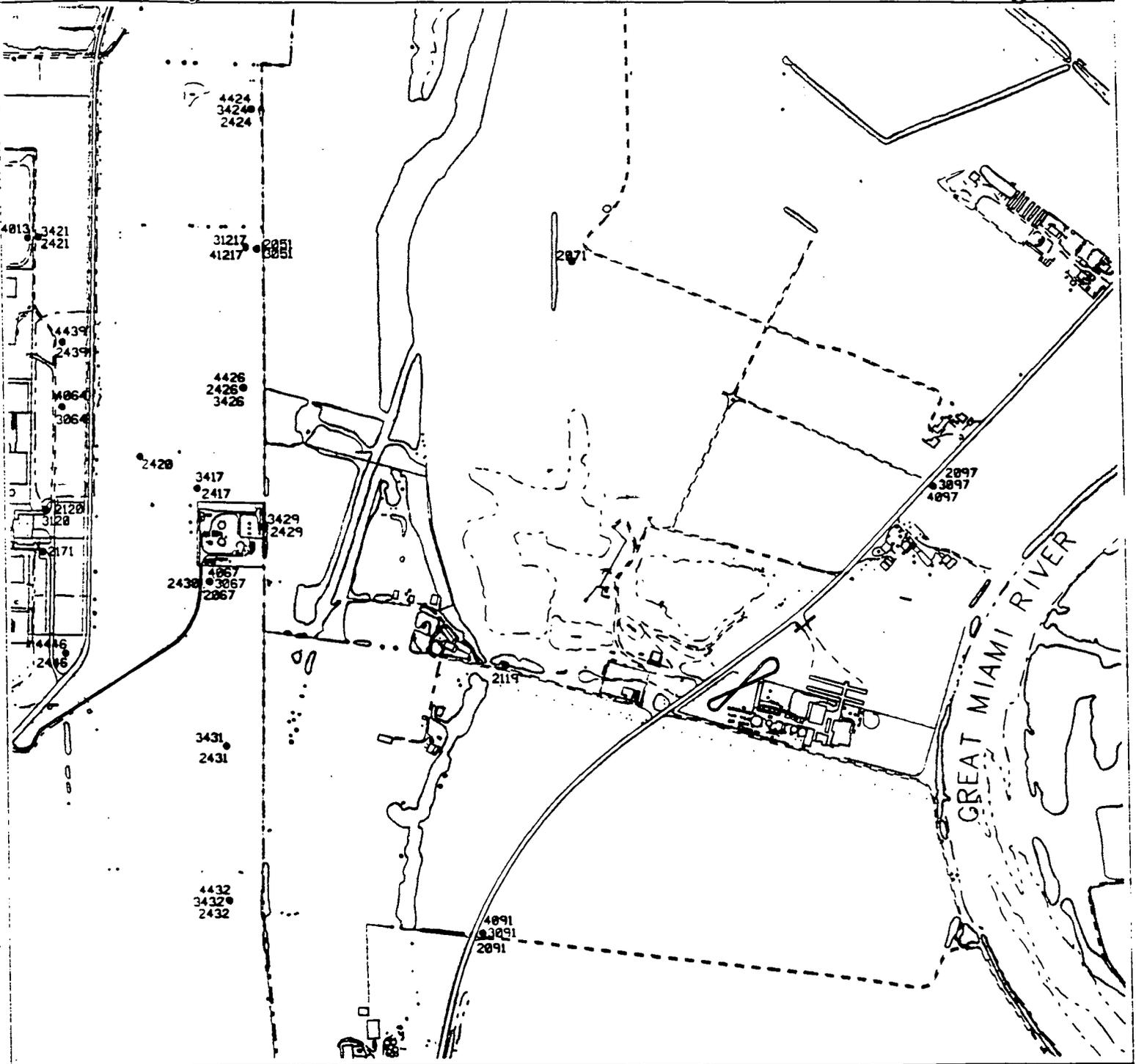
0034

**TOTAL URANIUM IN HYDROPUNCH SAMPLES  
COLLECTED FROM MONITORING WELL 2119**

Depth	Lab	Conc. (ug/L)
28.0	FERMCO	1.0
41.0	FERMCO	0.7
51.0	FERMCO	0.6
61.0	FERMCO	0.5
71.0	FERMCO	0.3
71.0	ITOR	<1.0
81.0	FERMCO	0.8
91.0	FERMCO	0.5
101.0	FERMCO	1.3
111.0	FERMCO	<1.0
121.0	FERMCO	0.3
131.0	FERMCO	1.0
141.0	FERMCO	0.2
151.0	FERMCO	0.2

**APPENDIX B**

**OSTC-9**



MONITORING WELL LOCATION MAP



0037

Figure 3