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USEPA COMMENTS ON FEDERAL FACILITY COMPLIANCE AGREEMENT (FFCA) DELIVERABLES

06/24/87

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COMMENTS

DOE-FN

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

5RA-14

24 JUN 1987

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

James A. Reafsnyder
United States Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37831

Dear Mr. Reafsnyder:

The United States Environmental Protection Agency (U.S. EPA) has completed its initial review of the Remedial Investigation/Feasibility Study (RI/FS) Work Plan and supporting documents for the Feed Materials Production Center in Fernald, Ohio. In general, the following deficiencies have been identified:

a) The United States Department of Energy (U.S. DOE) must develop a process or mechanism for intergrating past data or data collected from additional studies into the RI/FS procedure. U.S. EPA must be assured that all data collected outside of the RI/FS activities be handled in a manner consistent with U.S. EPA quality assurance/quality control (QA/QC) protocols;

b) U.S. DOE should design their investigative efforts such that they collect data sufficient to support remedial actions which meet the requirements of §121 of the Superfund Amendments and Reauthorization Act of 1986 (SARA); specifically, remedial action that will attain legally applicable or relevant and appropriate standards, requirements, criteria, or limitations. For this reason, U.S. EPA cannot, for example, approve a reference level of 35 pCi/gm of uranium in soils; nor use U.S. DOE's quidelines for uranium in water as a baseline comparison for groundwater contamination;

c) The Federal Facility Compliance Agreement (FFCA) included a Scope of Work (SOW) for the RI/FS. The SOW requires that U.S. DOE perform several investigative steps to determine the impact of current radiological and chemical waste management and past

disposal practices on the environment. These investigations must be carried out both on-site and off-site to adequately characterize the extent of contamination (whether radiological or chemical in nature) and the concentration of each contaminant in the various media (for example, soil, surface water, groundwater); and

d) The FFCA specifically states the various components of each investigative step. Although U.S. DOE agreed to do this work when signing the FFCA on July 18, 1986, the Work Plan is missing vital elements specified in the SOW. For example, U.S. DOE has not proposed an analytical program which conforms with the SOW (for example, Hazardous Substance List analyses on all samples, both on-site and off-site). Additionally, U.S. DOE has indicated a reluctance to conduct the comprehensive study of radiological impacts on the off-site population within a 50 mile radius of th site pursuant to paragraph f, Task 3 of the SOW. These elements are essential components of the endangerment assessment, and therefore the U.S. EPA expects adherence to these requirements as agreed between the Agencies.

Specific comments as to deficiencies in the RI/FS Work Plan are enclosed with this letter. In accordance with the FFCA, U.S. DOE should modify the Work Plan and submit a revised version within forty-five (45) days of receipt of this letter. In addition, we have attached to our comments those of the Ohio Environmental Protection Agency. If you have any questions concerning this matter, please contact Mr. William Franz of my staff at FTS 886-7500.

Sincerely yours,

Valdas V. Adamkus
Regional Administrator

Enclosure

WORK PLAN, DECEMBER 1986

- Section 2.1.1, page 2-1 should include a discussion on thorium operations and operations involving transuranics. In addition, clarification that 1.25% uranium-235 is by percent weight is requested.

- Section 2.1.2, pages 2-2 and 2-4 should include a description of the geological fault characteristics of the site area. It is our understanding that the New Madrid Fault terminates in the nearby vicinity (Attachment 1). In addition, the soil types and properties based on Hamilton and Butler Counties soil surveys should be identified.

- Figure 2.1, page 2-3 displays code numbers that are very difficult to read. Further, the map does not show all site features, i.e. the K-65 silos.

- Section 2.1.3, pages 2-4 and 2-5 should include a passage addressing radionuclides in soils. The 1984 Environmental Report, page 20 shows depositions of 65 parts per million (ppm) of uranium at the east fence and up to 14.3 ppm uranium in the nearby town of Ross.

- Section 2.1.3.1, page 2-4 states that the "airborne uranium concentrations have been within applicable standards." Releases in the past are very speculative and, therefore, this statement should be clarified. In addition, the term "applicable standards" must be defined.

- Section 2.1.3.2, page 2-5 addresses sampling for uranium in off-site wells. The levels detected are above background but below DOE guidelines and also below the upper limit recommended by the U.S. Public Health Service. Levels should also be compared to EPA proposed criteria. Further, this section states that these levels are found in non-drinking water wells. Our information is that some contaminated wells were drinking water sources and, thus, the WP information is misleading.

- Section 2.1.3.3, page 2-5 should address the waste pits as sources of environmental concern in terms of their potential for leaking and therefore contaminating groundwater.

- Figure 2.2, page 2-6 should include "atmosphere" in the list of On-site Receptors and Pathways. The K-65 silos and the thorium inventory will impact the on-site atmosphere to an extent that should be determined.

  For the Off-site Pathways:

  - Resuspension of contaminated soils at the site may be an issue and, thus, a black dot should be added at "atmosphere";

  - Discharge of "stormwater" to the "Great Miami River" has occurred and, thus, a black dot should be added;

- Milk should be added as an off-site pathway. This could be part of a larger topic of foodstuffs.

° Figure 2.3, page 2-7 should include soil as a pathway and include black dots at direct contact and inhalation. In addition, milk should be added and show a black dot under the "ingestion" column. Further, direct contact may come from the regional aquifer when bathing, washing and cooking.

° Section 2.2, pages 2-8 to 2-12 should include a passage specifically addressing the thorium storage areas. Section 2.3.2, page 2-13 states that the FMPC is DOE's thorium repository.

° Section 2.2.2, page 2-10 states that the burn pit was constructed in 1957 and used to dispose of laboratory chemicals and to burn combustible materials, including pyrophoric and reactive chemicals, non-polychlorinated biphenyl oils, and other low-level combustible materials. The section does not state what year DOE ceased use of the burn pit for disposal of chemicals. We would appreciate this information along with a statement as to whether or not there are storage piles of pyrophoric material (waste or product) at the site.

° Section 2.2.3, page 2-10 states that the spent lime that is used to lower pH and precipitate uranium at the FMPC water treatment plant operations is conveyed to two unlined ponds for storage. We anticipate that some uranium may be in the ponds. Therefore, the sentence expressing that "no hazardous materials are recorded as being received at the "lime sludge ponds" may not be accurate.

° Section 2.2.4, pages 2-10 and 2-11 refers to two fly ash piles utilized for the disposal of fly ash from the coal-fired boiler plant. As fly ash has been shown in some cases to have a high radium content, this point should be investigated. This section should state whether oils containing uranium were spread over areas, other than the fly ash piles, for dust control purposes. In addition, a site map of the piles and the Southfield area should be included in the WP.

° Section 2.2.5, page 2-11 should include the historical impacts on the K-65 silos even though it is expressed in another area of the WP.

° Section 2.2.6, page 2-11 states that Metal Oxide Tank 3 stores approximately 18,000 kilograms of uranium, some metal oxides, heavy metals, and trace amounts of radium. If this tank is not sealed, then radon impacts should be investigated.

° Section 2.2.9, page 2-12 may need to include other facilities, if any others have been deactivated, for example the liquid waste incinerator.

- Section 2.3.1, page 2-12 should include transuranics as they are being handled at the FMPC and may have been handled in the past. Transuranics should not be omitted as potential sources of contamination.

- Section 2.3.6, pages 2-13 and 2-14 should include a discussion of transuranic materials such as the recently handled POOS material. All existing underground tanks should be tested for leaks and old tanks which are leaking or out of use should be removed from the site.

- Table 2.1, page 2-15 should include another column identifying disposal methods for each waste stream.

- Section 2.4.1, pages 2-14 and 2-21 needs to address the impacts of radionuclides other than uranium such as thorium, plutonium and technetium.

- Section 2.4.5, page 2-22 should note investigation of off-site areas near the incinerator to the east of the site as the 1984 Environmental Report, page 20, shows elevated concentrations of uranium that extend to the town of Ross. (Attachment 2)

- Section 2.5.1, page 2-23 mentions that the RI activities include the quantification of cumulative doses to off-site populations due to 35 years of emissions from the facility. Computed doses should be compared to applicable regulatory dose limits such as 25/75 millirem per year whole body/organ doses, respectively. In addition, radon/thoron daughter doses should be computed.

- Section 2.5.3, pages 2-23 and 2-24 should address the desire to investigate the Great Miami River drinking water sources even though this is discussed later in the WP.

- Section 2.5.5, pages 2-24 and 2-25 should clarify that three private wells to the south of FMPC were used as a potable water supply until the contamination was made public. Further, the section fails to note the radionuclide contamination found in on-site wells at the nearby Albright-Wilson facility. Excessive amounts of uranium-238 were found in treated wastewater sludges which became a disposal problem during June 1986. This information should be recognized and included in the RI/FS study parameters.

  Any contamination in drinking water supplies should be compared to present and newly proposed EPA drinking water standards.

- Section 2.6.1, page 2-25 suggests that direct contact with contaminated soils, sediments and surface waters at off-site locations will not "represent a significant health issue." Evidence as to how this statement was formulated is requested. We believe it would be premature to design the sampling program on this premise.

- Section 2.6.2, page 2-25 should include resusupension effects of uranium contaminated soils east of the FMPC fence.

- Section 2.6.3, pages 2-25 and 2-26 must consider ingestion of sediments from children playing in Paddy's Run or the Great Miami River, as well as ingestion of contaminated groundwater from existing or future wells.

- Section 2.6.4, page 2-26 does not say how DOE determined that "irradiation is more a problem of the production area work place than an off-site environmental pathway." The basis for this statement is requested.

- Figure 3.1, page 3-2 need not only be an example. The charts (Figures 3.3 - 3.6) that follow are not examples. A full chart as an intended investigation outline would be extremely beneficial.

- Section 3.2.2, pages 3-7 to 3-10 should include information on possible influencing factors such as floods, tornados and earthquakes to assess their potential to contribute to environmental contamination.

- Section 3.2.2.7, page 3-9 should put public health and the environmental risks (doses) posed by the wastes in perspective by comparing them to other risks (doses), to natural background (risks, doses) and to regulatory limits (doses).

- Section 3.4.1.3, page 3-20 does not address contaminated groundwater at FMPC. Cleanup standards as provided in Section 121 of the Superfund Amendments and Reauthorization Act would have to be met, including state applicable, or relevant, and appropriate requirements (ARARs). The second paragraph expresses concern that regional sources of groundwater pollutants would likely reduce the effectiveness of the pump and treat alternative. No evidence or data is given in the WP to substantiate this information. FMPC is fairly well isolated and it is doubtful this would occur. The Description of the Current Situation confirms this by stating that on-site production wells were not believed by Spieker and Norris (in their 1962 groundwater study of the area) to be influencing regional groundwater movement. The feasibility of groundwater pumping and treatment should not be determined in the RI/FS WP, but instead should be determined in a properly conducted FS.

- Section 3.5.1, pages 3-25 and 3-27 suggests that remedial action to clean up contaminants, whether in soils or groundwater, at off-site receptors has already been rejected and, hence the RI will not be oriented to determine whether such action is necessary. Careful review of the site-specific plan is necessary to ensure that such remedial action options are not prematurely rejected.

- Section 3.6, pages 3-28 to 3-31 addresses potential remedial actions for reduction or elimination of sources and pathways of contaminants. However, the actions apply only to water. In addition, there could be a need to

remove soils or sediments, restrict grazing or restrict certain foodstuff usage.

° Section 3.6.1.2, page 3-30 suggests the use of point-of-use treatment schemes, which are not currently an acceptable method of treating drinking water. The Ohio Department of Health needs to be consulted on the acceptability of such methods for private systems before study conclusions are written about this suggestion.

° Section 4.2.1.1, pages 4-5 and 4-6 states a reference level of 35.0 picocuries per gram (pCi/gm) which is too high for a screening level. Contamination on and near this site may be due not only to depleted or slightly enriched uranium and thorium but may be due to ore materials used in the early extraction operations. Natural uranium in soil has a concentration commonly about 1.0 pCi/gm. Therefore, in setting a 35.0 pCi/gm reference level contamination may be ignored 10 to 20 to 30 times above normal. We strongly recommend that a 10.0 pCi/gm reference level be used for both uranium (U-238 + U-234) and thorium (Th-232 + Th-228) screening (see 46 CFR 52061). In addition, a technical discussion must be presented on how survey readings are translated to equivalent soil concentrations.

DOE should supply EPA with the rationale for establishing the number of sampling points; the size of and patterns for areas to be surveyed; and the radial extent of the investigations. One-hundred foot grid dimensions, while keeping the total number of sample points down, means that major features such as the K-65 silos, are represented by only one grid square. Grid dimensions must be reduced to better define the problem area.

° Section 4.2.1.2, page 4-8, Sampling Locations and Frequency states that 6 samples will be collected from each waste area, but Figure 4.2 displays less than 6 sampling locations. This needs to be clarified.

° Section 4.2.1.3, page 4-10 implies that 700 soil samples will be taken over the 1050 acre FMPC property. This can be translated as 1 sample for every 1.5 acres. Consideration should be given to expanding the number of samples taken.

° Figure 4.3, page 4-11 shows fine grid sampling on the FMPC, presumably 100 foot grids. We can only assume that the coarse grid off-site would be much larger such that definition of the known contamination from the east incinerator into the town of Ross could be lost. The coarse grid size should be revaluated.

° Section 4.2.1.3, page 4-12 states that 100 surface soil samples will be subjected to the full radiological testing program. We request information on what will become of the remaining 600 soil samples. Based upon afore-mentioned comments, this may be interpreted to mean that only 100 data points per 1050 acres (equivalent to 1 point per

10 acres) will be collected. This would not give an accurate definition of the site.

° Section 4.2.1.4, page 4-14 should state that borings that are drilled around waste pits must be back-filled with bentonite-cement grout.

° Section 4.2.1.5, page 4-18 should include sampling not only uranium but other possible contaminants such as thorium, radium 226/228, transuranics and technetium.

° Figure 4.6, page 4-20 displays an insufficient amount of sampling points along the Great Miami River. This sampling plan will not offer enough information about site problems. We suggest adding the sites shown on Attachment 3.

° Section 4.2.1.8, page 4-21 should address air monitoring of radon-220 and transuranics.

° Section 4.4.1, pages 4-13 to 4-33 addresses methods of data evaluation. Prior to the time the data is collected and reviewed, our involvement in determining the method of data evaluation would be beneficial in the long run for our concurrence with your final conclusions.

° Section 4.4.2, pages 4-33 to 4-40 describes the preliminary groundwater flow simulations upon which the groundwater sampling program will be based. Since the quality of the simulations depends on the adequacy of the data used to run the model, DOE needs to ensure that there is enough information available. The 1985 Geotrans modeling study identified data gaps to the Southeast and West of the site. The report recommended the installation of 36 monitoring wells to better define groundwater flow directions and aquifer hydraulic properties at FMPC. Before DOE runs its aquifer simulations, some additional wells should be installed and sampled in the areas recommended by Geotrans. This will allow DOE to build and improve upon previous work rather than starting the simulations with identified data gaps.

° Section 4.4.3, page 4-41 should include other possible contributing radionuclides such as thorium, thoron, and transuranics in the year-by-year inventory of emissions. Radionuclide emissions that contribute to at least 90% of the total inhalation dose should be itemized for the computation of the off-site concentrations and deposition levels. (Emissions data is required to follow the AIRDOS/EPA model of computation.)

° Section 4.4.3.4, page 4-43 states the required information unique to each radionuclide for the AIRDOS/EPA calulations of air concentrations and resulting inhalation doses. This information includes deposition and gravitation settling velocities and dose conversion factors.

To avoid inconsistency on the performance of AIRDOS calculations,

it would be prudent to have discussions with EPA on input data such as settling velocities, dose conversion factors, consumption factors, etc... before the performance of computer runs.

° Section 4.4.4, pages 4-44 to 4-47 should state that an Endangerment Assessment (EA) will be conducted at the FMPC that follows and is consistent with CERCLA/SARA, the USEPA guidance document "The Endangerment Assessment Handbook" (August 1985), and the USEPA document titled "Toxicology Handbook - Principles Related to Hazardous Waste Site Investigations" (August 1985). The purpose of an EA is to address the potential human health and environmental effects of a site under the no action alternative.

The heading "Public Health Risk Assessment" should be changed to "Endangerment Assessment." Under CERCLA/SARA and USEPA guidance, an EA consists of the following four elements:

1. Identification of Contaminants of Concern
2. Toxicity Assessment
3. Exposure Assessment
4. Risk Characterization

° Section 4.4.3.6, pages 4-43 and 4-44 states that "radioactive material in the soil to vary significantly over a small area" reinforces the need to reconsider the grid sizes to be used as mentioned in previous comments: Section 4.2.2, page 4.6; Section 4.2.13, page 4-10; Figure 4.3, page 4-11; Section 4.2.1.3, page 4-12; and Figure 4.6, page 20.

° Section 4.4.4.1, pages 4-31 and 4-32 should change the title of "Hazard Identification" to "Contaminant Identification" to correspond with the above-mentioned guidance. The third bullet item in this section should not be included here, but instead should be included and discussed in the toxicity assessment portion of the EA. Contaminants of concern are usually selected on the basis of their intrinsic toxicological properties, because they are present in large quantities, or because of potentially critical exposure routes (i.e., being released into a drinking water supply).

° Section 4.4.4.2, page 4-45 assumes that biological effects of radiation exposure will be a linear, no threshold dose - response relationship. The report states that this will lead to an overestimate of the effect of low doses. However, some researchers have found this relationship to underestimate doses in some situations; alpha dose is an example. Therefore, we recommend your statement about overestimation of dose be deleted from the WP. In addition, the last paragraph indicates the toxicity due to chemical exposure follows a threshold dose - response relationship. To the extent that toxic response is cancer, this is inconsistent with the present EPA practice, which assumes a no threshold model. The text should be modified accordingly.

° Section 4.4.4.4, page 4-47 should integrate all of the information that is developed in the exposure and toxicity assessments to yield a complete characterization of all types and potential or actual risks at the FMPC including carcinogenic risks, noncarcinogenic risks, environmental risks and risks to public welfare. Risks to public welfare include adverse effects on property values, future land uses, recreational and commercial activities, public perception and opinion, quality of life, etc.

° Section 4.4.4.6, page 4-43 addresses the groundwater protection standards. The inclusion of this section within the Task 4 Section of the WP is unclear. However, parameters other than those contained in Table 3 of 40 CFR 264.91 are also relevant to a risk assessment.

The CLP priority pollutant list will be compared to the recommended limits in Table 1 of 40 CFR 264.94. Table 1 is a partial list of the maximum contaminant levels permitted by the National Primary Drinking Water Regulations in 40 CFR 141 and as such are more than just recommended limits. This entire section should be deleted because contaminants of concern should be identified and discussed as part of the endangerment assessment and clean up standards for contaminants both on and off-site must be those specified in Section 121 of SARA and must include state ARARs. RCRA issues discussed in this section and in the Scope of Work may be part of Federal ARARs for FMPC and should be addressed in the FS.

° Section 5.4, page 5-5 discusses the development of alternatives for source control or off-site remedial actions, or both. EPA has standards under development that may be applicable at the time remediation is initiated at the site. These should be considered during the data collection and analysis phases and in the alternative development phases in order for options to be fully investigated and determined feasible for implementation. This comment is in direct reference to proposed drinking water standards for uranium and radon.

° Section 5.5 to 5.9, pages 5-6 to 5-13 Tasks relating to the FS (Tasks 12-16) should be modified to reflect considerations imposed under Section 121 of SARA. This section states that under initial screening of alternatives DOE must also look at whether the alternatives will permanently reduce the volume, toxicity or mobility of the wastes. In addition, alternatives with an unproven technology should not automatically be ruled out from further investigation (Section 121 (b)(2)).

° Section 6.5.1, page 6-21 refers to a period of 700 days to elapse before obtainment of a draft RI. We find this to be an excessive length of time to put off remediation.

Volume I, Task 1 Report: Description of Current Situation

- Section 1.1, page 1-1 should specify that studies conducted at the waste storage area will be integrated into the final feasibility study report for the site.

- Section 1.2, page 1-2 should explain how DOE arrived at the conclusion that excessive emissions from Plant 9 operations have caused no discernible impacts off-site.

- Section 1.2, page 1-3 should include a discussion on whether the contaminant concentrations in off-site wells are below USEPA proposed criteria.

- Section 1.3, page 1-3 mentions that DOE's specific objective of the RI is to predict future impacts with and without remedial action in lieu of future observations. We would appreciate an explanation of this statement as we find disagreement with its intent.

- Section 2.2.7.2, page 2-18 states the Dames and Moore conclusion that the most likely transport pathway by which uranium reaches the off-site wells is from contaminated surface water run-off to Paddy's Run. They further concluded that the uranium is most likely not being transported off-site from the waste pit storage area via the groundwater. The groundwater sampling study must determine whether these assumptions are correct or not. Both pathways are viable. We should ensure that all studies at DOE are throughly integrated to make this verification.

- Section 2.3, page 2-25 and Figure 2.13, page 2-26 both specify that the Knollman grazing areas on FMPC are located on areas with high uranium contamination in the soils. However, DOE does not appear to be proposing to conduct further dairy and beef studies of cows grazing in these areas. This must be rectified.

- Section 3.1, page 3-1 should identify all waste generation and disposal practices conducted by the National Lead Company of Ohio (NLO) since 1951. Any other areas not mentioned in this report that were used for disposal by NLO will also need to be identified.

- Section 3.1, page 3-5 leaves us to question whether DOE has maintained manifests for all hazardous wastes that have been shipped off-site. These procedures are relevant and should be followed.

- Table 3.1, page 3-7 should identify the methods of disposal of all the waste streams identified in Table 3.1.

- Section 3.4.1, page 3-20 leaves us to question whether DOE will propose to investigate the integrity of the Clear Well and whether contamination has occurred there. An analysis is recommended.

° Section 3.5, page 3-25 is confusing as to the number and years of operation of the different incinerators at the facility. DOE must clarify the location of the deactivated solid waste incinerator that operated prior to 1979 and the location of the oil burner which is now deactivated, which DOE proposes to study. DOE must further clarify which solid waste incinerator and oil burner are the subject of the pending Air Program action. The dates of operation of the incinerator and oil burner that are the subject of the pending Air Program action should be identified. In addition, DOE should identify the hazardous substances burned at each of these facilities and the dates such materials were burned.

° Section 3.6, page 3-27 mentions the location of the Southfield area, however, it is not identified in Figure 2.2. This site should be shown in Figure 2.2.

° Section 3.6.4, page 3-28 does not mention how drums are stacked such that DOE can make the determination that they are in good condition. If the drums are stacked too high and too close together to make this determination, DOE is requested to revise this statement accordingly.

° Table 3.2, page 3-33 specifies the FMPC Material Code 129 as having a "high uranium content." We would appreciate an explanation on the requirements of this classification.

FMPC Material Code 135 should specify if this is a classification for uranium that is greater than 20% assay. We would appreciate an exact assay number and information on whether this is still less than a fissionable quantity.

° Section 3.6.8, page 3-36 describes past waste disposal activities. DOE should provide USEPA with the sample results of all groundwater samples taken in the waste pit storage area, particularly during the time that shallow groundwater was pumped as described on page 5-9. The shallow groundwater pumping scheme took place in the early 1960's. Data results and the reasons for the pumping in the early 1960's must be reported.

° Table 3.4, pages 3-38 and 3-39 offer only uranium, uranium-235 and thorium quantities for the facilities. Other radionulides may be present at these facilities, such as the radium content at the K-65 silos. Their quantities should be recorded.

Data in this table indicates that, for K-65 Silos 1 and 2 at least, this material should be handled in accordance with requirements for transuranic wastes. USEPA Office of Radiation Programs, on January 2, 1987, offered a judgement (Attachment 4) that,

for K-65 wastes stored at the Niagara Falls Storage Site (NFSS), the concentrations were sufficiently high that

(1) the K-65 residues should be maintained isolated from other wastes at NFSS;
(2) the provisions of Subpart A of 40 CFR 191 should be satisfied by the interim storage site;
(3) the K-65 wastes should be disposed of in conformance with Subpart B of 40 CFR 191 as soon as a suitable repository is available.

The NFSS K-65 wastes had an average peak concentration of 520 nanocuries per gram (nCi/gm). FMPC K-65 wastes appear to have an average concentration of about 1600 nCi/gm (assuming 2 gm/cm^3 for 17600 curies in 7200 yd^3). 40 CFR 191.03 specifies standards of 25 millirem to the whole body, 75 millirem to the thyroid and 25 millirem to any other critical organ which, therefore, are applicable to emissions of radon. Radon (both Radon-222 and Radon-220) emissions will have to be controlled to meet those dose limits. A determination should be made for all stored wastes, with special attention to thorium wastes, as to whether or not the peak concentrations meet or approach the 100 nCi/gm criteria for transuranic wastes.

° Section 3.6.8, page 3-41 should include information of known present problems with the waste storage silos, including any continuing problems with the structural support and radon releases from the silos. The information presented here seems to indicate that there are no continuing problems at the storage sites. In addition, it is recommended that DOE identify the boundaries of the burn pit area as part of the RI study.

° Section 3.6.10, page 3-46 should include analysis of the effects on the milk and beef from cows grazing in the Knollman acres as soil is contaminated with radionuclides. In addition, it may be beneficial to analyze, for polychlorinated biphenyl (PCB) content, the oils that were spread over the fly ash to control dust.

° Section 3.7.1, page 3-47 should describe the interim remedial measures that have been made on the current inventories of thorium-bearing compounds. Any waste materials awaiting recycling or recovery, must be stored in compliance with RCRA pursuant to 40 C.F.R. Part 261.6 and in compliance with 40 CFR 191, high-level and transuranic waste standards.

° Section 3.7.3, page 3-47 states that "thorium is currently not classified as waste." Thorium constitutes a hazardous substance and is therefore a proper subject of the RI.

° Table 3.7, page 3-48 does not state anything about the contents of the 2,448 drums. This information is essential knowledge.

° Table 3.9, page 3-55 leaves us with a question as to whether contaminated

solvents that are stored in the pilot plant are stored in compliance with RCRA. This question needs to be resolved.

° Table 3.10, page 3-56 states that 35.7 metric tons of high grade thorium residues are stored in Building 67 and West Building 65 and 0.2 metric tons of low grade residues are stored in Building 67. For residues with greater than 30% thorium, an estimate of how great the assay is will be necessary information and if there is any potential for fission of this material.

° Section 3.8.1.2, page 3-61 states that "radionuclides in surface water on the downgradient off-site locations are substantially reduced." This statement should be further qualified to identify the distance between the sampling locations that were used in order to support this comment.

° Section 3.8.2.1, page 3-61 must describe the location and the construction of the "numerous" other wells in the vicinity of the FMPC that have been investigated over various times. As part of the Task 1 Report, DOE should be assembling all of this information and reporting it to USEPA. This is particularly true, if DOE intends to rely upon the information obtained from the "numerous" other wells.

° Table 3.13, page 3-62 and Table 3.14, page 3-36 do not offer the source of the presented data. Assuming this is 1985 data, with uranium-238 discharges at W-2 running at 54% of FMPC guidelines, then we can reasonably assume discharges to the Great Miami River in the past were higher. This substantiates the need to thoroughly examine this river's environs. In addition, the analytical results reported throughout the report indicate that DOE selected different radionuclides to analyze at different periods of time, at different locations, and for different media. The sampling program should apply consistent analytical parameters for the different media, or supply a justification for selecting among the different radionuclides used for analysis.

° Table 3.14, page 3-64, Footnote (b) specifies a non-uniform collection schedule which makes comparisons extremely difficult and/or impossible. The schedules must be consistent.

° Figure 3.8, page 3-67 displays that no groundwater monitoring wells are located to the southeast of the FMPC and only 1 is located to the

east. Additional wells in both areas are recommended.

° Figure 3.9, page 3-68 depicts monitoring wells as clusters upstream of the FMPC discharge pipe on the Great Miami River, but none are present between the discharge and Paddy's Run (including near New Baltimore). Additional wells are recommended between the discharge and Paddy's Run.

Section 3.8.2.1, page 3-61 had referred to Figure 3.9 by stating wells were used at various times. The report should state if all wells are potentially usable for the RI study.

This Task 1 Report should include information on the construction of off-site monitoring wells depicted in Figure 3.9 and any analytical results obtained from these off-site wells.

° Section 3.8.2.2, page 3-69 discusses the 41 site monitoring wells. A site map should be included to clarify which "off-site" and "on-site" wells will make up the 41-well monitoring system.

° Table 3.18, page 3-72 should compare sampling results to USEPA proposed or accepted criteria, standards or quidelines. Sampling results of wells shown in Figure 3.8 should be listed in this table.

° Table 3.19, page 3-73 does not mention the time frame in which the data was collected. It is not a reasonable comparison to use the FMPC uranium in water guideline for this well water data. At least two sampling points would be in excess of EPA proposed standards.

° Section 3.8.2.2, page 3-74 is not tabulated information in the document. An explanation of the statement under the Till Groundwater Quality headline as to the amount of "excess from USEPA drinking water standards" that has been detected in wells would be beneficial knowledge. In addition, the second bullet contains a double negative. This sentence needs to be corrected.

Under the Sand and Gravel Aquifer Water Quality - Production Area, the second bullet needs to display a consistent unit of pCi/l.

Sand and Gravel Aquifer Water Quality - Outside Production Area should quantitatively compare the groundwater from wells located outside the production area with background water samples for manganese and/or phenols. The report simply concludes that the background was high in these two parameters, but fails to indicate whether there was any increase.

The report concludes that "generally widespread VOC, pesticides, herbicides, and heavy metal contamination has not been present in groundwater at the FMPC." The report should indicate whether localized areas of these contaminants have been discovered.

° Section 3.8.3.1, page 3-76 should identify by name or site symbol the existing and new air monitoring sites.

° Section 3.8.3.1, page 3-79 conveys the schedule and device for thoron sampling. The USEPA, Region V has found alpha track monitors incapable of giving meaningful results for thoron (refer to 1985 Environmental Monitoring Report, page 18).

° Section 3.8.3.2, page 3-79 specifies compliance with Federal and State 24-hour total suspended particulate standards. However, it is not stated whether all FMPC air monitors meet EPA siting criteria in 40 CFR 58. During a site visit, it became apparent that a western sample site near the Clear Well was in a gully sheltered by trees.

° Table 3.22, page 3-84, Footnote (a) does not clearly identify which concentration in the table correlates with which particular Sampling Station. This problem needs to be resolved.

° Section 3.8.3.2, page 3-85 must clarify if locations 1-9 are also known as locations BS1 - BS9. In addition, the designations for air monitoring sites in Table 3.22 and in this section do not agree with those on Figure 3.10.

We can only assume that the reason for high readings at Sampler BS3 is due to its location near the incinerator. However, it is unclear as to why BS2 and BS8 readings are not as high since they are located between high reading sites BS1 and BS3. The cause for this discrepancy must be investigated.

° Table 3.23, page 3-87, Footnote (a) indicates that comparisons were not consistently made against the same standard. Each applicable standard should be identified.

° Section 3.8.4.1, page 3-93 should be changed to reference Figure 2.12, not Figure 2.11. More information could have been obtained from the Biological Resources Monitoring Program, if gamma scans were performed first and subsequently followed by further analyses for specific radionuclides present. In addition, the report should identify the locations where milk samples were taken and the soil concentrations of the acres that were grazed by the sampled cows.

° Section 3.8.4.2, page 3-93 should not only focus on uranium in the soil analyses.

This section makes a citation to Figure 2.9 which is an incorrect cite. The cite should be to Figure 2.12.

° Table 3.28, page 3-94 display sampling points 7, 10, and 27 to be close together as are points 13 and 26. We question why these are not grouped together with the results of sampling efforts. For the RI, soil and vegetation sampling points must be added at high uranium concentration sites identified in the 1985 Environmental Report (Figure 10, page 25).

° Table 3.29, page 3-95 should include parallel grass and soil samples at locations 22-29.

° Table 3.30, page 3-96 and Section 3.8.4.2, page 3-97 raises an uncertainty in the usage of potatoes as an indicator of foodstock contamination. This problem should be evaluated. Table 3.30 lists the highest concentration of uranium in potatoes as 1.22 pCi/gm. However, the 1981 study by Batelle uses 0.016 mg/gm as an average uranium concentration in vegetables. This converts to 10.8 pCi/gm, an order of magnitude greater than the potato level. Moreover, this is an average level while the potato concentration was at peak level. It must be assumed that vegetables with uranium concentrations greater than 0.016 mg/gm were measured.

° Section 3.8.4.2, page 3-97 should identify the areas where milk samples were taken.

Consumption of canned vegetables is only one of several pathways of exposure to persons living near FMPC. The RI report must assess the cumulative exposure from various pathways.

DOE should describe the basis for its analyzing certain samples for parameters other than uranium, and why other samples were only analyzed for uranium.

° Tables 3.30, page 3-96; Table 3.31, page 3-98; and Table 3.32, page 3-99 must state against what concentration criteria should these foodstuffs be judged or, alternatively, their corresponding dose levels as a result of consumption.

° Section 3.8.5.2, page 3-102 and Section 4.3.2, page 4-14 suggest the use of 35.0 pCi/gm as the acceptable soil contamination guideline. Assuming this is natural uranium (which was the primary feedstock of the site for decades, and also the most protective assumption healthwise), then 10.0 pCi/gm is a more appropriate level relying upon

Nuclear Regulatory Commission's uranium guidelines in 46 FR 52061 and 5.0 pCi/gm may be reasonable relying upon the radium content of the EPA standards in 40 CFR 192.

° Table 3.35, page 3-105 leaves us to question whether DOE has determined the chemical or radiological composition of the smoke which is released during blowouts at the Rockwell furnace. This may prove to be beneficial information.

° Section 4.2.2, page 4-5 makes an incorrect assumption that analysis of on-site pathways are more important than the definition of off-site pathways. Both on-site and off-site pathways must be analyzed. This is true particularly where contaminant migration off-site has already occurred. The sampling programs described in the Task 2 Report fail to go off-site of FMPC. This is contrary to our agreement.

° Section 4.2.3.3, page 4-8 states that surveys are underway for the study of the flora and fauna of the FMPC. These surveys that FMPC intends to rely upon, and all other studies and surveys which DOE intends to rely upon, must be reviewed by USEPA to determine whether or not we can rely upon that data.

° Section 4.2.3.4, page 4-8 is misleading in its suggestion that the off-site wells that demonstrated contamination are not used as a potable water supply. The date at which these wells were discontinued as a potable water supply source should be identified in the report. Prior to that date, residents were using these wells as a potable water supply.

° Section 4.2.4.1, page 4-9 is premature in stating that direct contact is not a principal public health threat. This determination cannot be made until the RI is completed.

° Section 4.2.4.2, page 4-9 states that DOE intends to rely upon past and current studies to compute the inhalation exposure. USEPA must be assured that this data is reliable.

° Section 4.2.4.3, page 4-9 should include the potential health impacts from the ingestion of surface soil or stream sediments by children playing in Paddy's Run or the Great Miami River.

° Section 4.3.1, page 4-10 mentions that the on-site uranium contamination in groundwater near the storage areas was first detected in 1985. DOE should supply us with sample results, if any were obtained from this area in the early 1960's, when a groundwater pump-out scheme was initiated.

° Section 4.3.1, page 4-11 offers a 6.8 pCi/l level as a Great Miami River uranium concentration in water. Table 3.14, page 3-64 and Figure 3.7, page 3-60 indicate that the upstream uranium level is 1.57 pCi/l

(Sampling Point W1). This inconsistancy should be resolved.

° Section 4.3.1, page 4-12 makes references to previous sampling of existing wells in the waste storage area. DOE should identify the years those samples were obtained and provide us with that data.

° Section 4.3.2, page 4-13 refers to Section 3.0. This should be a reference to Section 5.0.

° Section 4.3.3, page 4-15 confirms the need to explore levels for all radionuclides likely to have been released from the FMPC. Current data is inadequate to describe off-site surface soil uranium contamination, and is not adequate to characterize on-site contamination of soils by radionuclides or hazardous chemicals.

° Section 4.3.4, page 4-16 should include the results of the surface water and sediment sampling. Overland flow should be included as part of the sampling plan.

The DOE report should describe the source of technetium that has been found at elevated locations at FMPC. The report should also describe the relative ability for plant and animal uptake of this element, its solubility and toxicity, compared to that of uranium. In addition, where DOE does not propose to analyze for this parameter, it should state the reason.

° Section 5.1.6, page 5-5 should confirm that until DOE makes the required analysis for the 44 other categories of potential RCRA waste, these wastes must be stored in compliance with RCRA.

° Section 5.1.7, page 5-6 states that a "slightly elevated" amount of uranium-238 was detected in soils outside the site boundary. The detection limit for the aerial survey should be provided along with the soil sample results in order to interpret data.

° Section 5.2.1, page 5-7 should clarify that corrective actions taken at the K-65 silos are interim measures only.

° Section 5.2.2, page 5-8 states that a study is currently underway to determine whether Pit 4 classifies as a RCRA hazardous waste impoundment. This is contrary to our agreement. DOE has acknowledged that Pit 4 is a RCRA hazardous waste pit.

° Section 5.2.4, page 5-9 should describe why a protective pumping scheme was initiated at the waste pit area. DOE should provide USEPA with analytical results from groundwater samples obtained from the waste pit area in the early 1960's.

° Section 6.0, pages 6-1 to 6-7 should state that the boundaries for the study area for the RI are preliminary boundaries only. The boundaries must extend outward, off-site, as contaminantion is found.

Throughout Section 6.0, DOE references numerous studies that it intends to rely upon to satisfy data requirements for the feasibility study. We must be assured that we can accept that data before USEPA agrees to the sampling plans proposed by DOE.

VOLUME I: SAMPLING PLAN

RADIATION MEASUREMENT PLAN

Specific Comments

° Section 1.1, page I.1-1, paragraph 4 - The most conservative attitude would be to assume soils are contaminated with natural uranium not depleted uranium. This was the main feed stock for several decades. In accordance with the Nuclear Regulatory Commission Branch Technical Position (46 FR 52061) the reference level should be 10 pCi/gm (U-238 + U-234).

° Section 1.1 page I.1-1, paragraph 5 - This paragraph mentions the reference level for Radium-226 in soil. However, nowhere does the plan discuss how levels of Radium-226 will be measured. There is no point in citing the Radium-226 reference level if the plan does not present methods of determining if this level is exceeded.

° Section 1.2, page I.1-2, paragraph 1 - Consideration should also be given to whether other radionuclides handled on the site should also be scanned for. For example, the FIDLER can also detect transuranic emissions. The focus of surveys must not be so narrowly on uranium that other radionuclides, possibly at hazardous levels, are missed.

° Section 1.2.1, page I.2-2 - The area to be sampled for radiation needs to be expanded in two areas. First, it is likely that loose dust (including uranium, thorium daughters, and so on) has been washed down into the storm sewers and settled in the storm water retention basin. Even if the release water appears "clean", the mud has probably accumulated radioactivity. Therefore, the sampling grid should be extended to include the storm water retention basin. Second, the plan relies on the earlier radiation measurements taken in the waste storage area. This area should be spot-checked (perhaps a row or two of 100-foot squares across the area) to ensure that the earlier data are still valid. If the newer measurements differ significantly from those previously, radiation in the waste storage area should be measured.

  DOE should clarify whether incineration areas stated in the text are the same as fly ash pile areas shown on Figure 1.1. If not, they should be shown on this figure.

° Section 1.2.1, page I.1-2, paragraph 4 - The Remedial Investigation must not be narrowly restricted to the FMPC site. Information is needed as well, probably more importantly, offsite. Finding soil contamination at the fence and only tracking it 300 feet offsite is not good public health practice. The 100 foot onsite gridding is too coarse, as major features, such as the K-65 silos, are represented by only one grid square.

° Figure 1.1, page I.1-3 - The grid system on this figure is not drawn to scale. Grid lines on the figure appear to be 200 feet apart rather than 100 feet apart, as stated in the text.

° Section 1.2.2, page I.1-4 - The plan states that "fifty locations will be selected", but does not say how they will be selected until Section 1.4.1. The selection method should be noted here.

° Section 1.2.3, page I.1-4 - How will the number be assigned to each grid after the walkover survey? Will this be the peak value, an average based upon specific sample points (such as grid intersections) or will this be a judgment call by the surveyor? Additionally, the plan refers to Section 1.3 and the QAPP for a description of detectors. The QAPP should include laboratory calibration procedures. All field procedures should be included in this plan or in SOPs (Standard Operating Procedures) that are incorporated here and submitted for review.

° Section 1.3, page I.1-4 - Reference comment for Section 1.2.3 above.

° Section 1.3.1, page I.1-5 - The plan states that a pressurized ionization chamber (PIC) will measure the average exposure rate for predetermined evaluation periods. The plans also state that the PIC will be correlated with the scintillation detectors. DOE should describe the following: what the predetermined evaluation periods are; how DOE will correlate PIC with scintillation detectors; how DOE will check for placement/time variations; how long these correlation measurement periods will be; and how long the measurement periods for scintillation detectors will be. This information must be included in the plan.

° Section 1.3.2, page I.1-5 - DOE states that the survey will be accompanied by moving a FIDLER probe in a serpentine pattern over the entire grid. DOE should define "serpentine pattern". DOE should also specify the distance between passes and how it will maintain that distance and alignment the of the passes.

Other items that need to be addressed include how these readings will be recorded; how often will readings be noted; and if DOE will locate hot spots within a 100 foot square or take an integrated or averaged reading for the entire square.

DOE states that measurements will be taken at locations with "apparent solid concentrations of uranium in excess of the reference level". DOE shold define the terms "solid" and "the reference level".

° Section 1.3.3, page I.1-6 - Reference comment for Section 1.2.3 above. The work plan should clarify whether the purpose of the delta-gamma method is to quantify surface contamination.

° Section 1.4.2, page I.1-7 - DOE states that the PIC will be used to "calibrate" the scintillation detector in the field. By taking measurements at the same locations, a relationship between PIC readings (microroentgen/hour) and scintillation detector readings (counts/minute) will be developed. However, the plan does not describe how the PIC will be calibrated.

° Section 1.4.2, page I.1-7 - The plan mentions approximately five test areas but does not state how DOE will choose these areas. The plan also does not state whether this calibration will be done before or after the field measurements are done.

SURFACE SOILS SAMPLING PLAN

General Comments

The FFCA calls for an off-site investigation of surface soil contamination to be conducted. Although past data may be used as a tool to guide this study, it may not serve as a replacement for data to be collected under the U.S. EPA approved QAPP. Therefore, the work plan should be revised to include an off-site soils investigation. This investigation must include both radiological and hazardous substance analysis.

Reliance is made upon a DOE soil contamination level of 35 pCi/gm or an FMPC reference level of 34 pCi/gm. These levels as determined during the radiation measurement phase will trigger additional investigation. Assuming this is natural uranium (which is the primary feedstock of the site for decades, and also the most protective assumption healthwise) then 10 pCi/gm is a more appropriate level for detailed sampling, not 35 pCi/gm. This is based upon the radium standard in the U.S. EPA standards in 40 CFR Part 192.

The highest level of uranium in soil concentration off-site (64.32 pCi/gm) was recorded east of the town of Ross. This reading is between one and two factors of ten over normal background levels of uranium in soil. This sampling program should be designed to determine the extent of contamination of any radionuclide or hazardous substance. This data should be used to determine what impact contamination may have on the public living in this area.

Specific Comments

° Section 2.3, page I.2-2 - The stormwater retention area should be added to the fine grid sampling (Figure 2.1) to satisfy the 1st objective of the sampling plan. DOE also should explain why fly ash pile ovens are not added to the fine grid sampling. Under the radiation measurement plan, these areas are included for radiation measurements.

° Section 2.3, page I.2-4 - The phrase "sample locations on the grid" needs clarification. DOE should state if samples will be taken at the intersections of the grid. The number of samples (total) should be expressed as anticipated maximums (a maximum of 200 samples).

  The grid system on Figure 2-1 is not drawn to scale. DOE should address a rationale for selecting only 200 soil sample locations (including biased sample locations). Based on a 100-foot grid system for the production area, sewage treatment area, and perimeter of the waste storage area, we estimate that there are more than 700 grid intersections. The 200 soil sample locations may be inadequate to ensure that a statistical representation of the area is obtained.

° Section 2.3, page I.2-4, paragraph 4 The sampling plan for the production area, sewage treatment area, and perimeter of the waste storage area states that only 10 soil samples will be analyzed for chemical constituents. This is not a sufficient number of samples to adequately determine the areal and vertical extent of hazardous substance contamination at the site. The U.S. DOE needs to expand this portion of the sampling plan to adequately characterize the

site with respect to hazardous constituents. If U.S. DOE intends to incorporate previously collected data, the sampling plan should clearly indicate on a map the previously sampled areas, and the areas where the new samples will be taken. U.S. EPA must be assured of the reliability of previously collected data.

° Section 2.3, page I.2-4, para. 3 and para. 5 - 100 foot survey grids have been selected but not justified. Justification for the 100 foot grid must be provided. A grid the width of the proposed serpentine survey pattern may give a more detailed (and therefore, more useful) data set? The plan did not address the number of soil samples to be collected for chemical analysis for the remaining areas wihin the FMPC site boundary.

° Section 2.4, page I.2-5 - In the 2nd paragraph of this section two different methods of soil sample collection are described. Why will two different methods be used when the only difference appears to be that some samples will be from six inch cores and others from two inch cores? This section must be clarified.

° Figures 2.1 and 2.2, pages I.2-3 and I.2-6 - Areas where six inch deep cores will be obtained should be coincident with the areas of surface soil sampling using the fine grid system of Figure 2.1. Likewise, areas where two inch deep cores are taken should be in those areas within the coarse grid system as identified in Figure 2.1.

GROUNDWATER SAMPLING PLAN

General Comments

The main purpose of a groundwater quality investigation is to determine the extent of contamination, rate of migration, and concentration of any contaminant. The groundwater sampling plan does not clearly reflect this. While groundwater monitoring well coverage onsite appears comprehensive, no additional monitoring wells are proposed for installation off-site. Three offsite wells are known to be contaminated. A determination of the extent of contamination is essential to this investigation. This information must be used to determine what dose is likely to be received by users of these wells and is essential to performing an exposure (risk) assessment for the site.

Groundwater investigations need to define if a cone of depression exists around the production wells and what effect this has on flow patterns in shallow and intermediate aquifers.

When exceedances of drinking water standards are discovered they should be noted. DOE standards of 1200 pCi/l for uranium in drinking water are not appropriate for comparisons and decisions on health impacts since U.S. EPA is proposing new drinking water standards for uranium in the 10-100 pCi/l range. DOE should report any levels of uranium above 10 pCi/l.

Specific Comments

- Section 3.0, page I.3-3 - Well 131 is unlabeled in Figure 3.2. Wells 310 and 401 are shown in Figure 3.2 but not on Figure 3.1. Also it is unclear on Figure 3.2 what some designations mean, such as 10(310), and 10(410).

- Section 3.0, page I.3-7 - Wells 220 and 320 are shown on Figure 3-3 but are not in Table 3-1.

- Section 3.2.2, page I.3-9 - DOE should install one three-well cluster south of the waste pit area at well 205. The proposed shallow wells given in Figure 3.2 will only "isolate" groundwater contamination effects from pit 4, but not from pits 1, 2, 3, 5 or 6. Therefore, the objective of these wells as stated in this paragraph will not be met.

- Section 3.2.8, page I.3-11, paragraph 2 - Additional off-site wells must be installed to determine the extent of contamination south of the site. A minimum of 3 well clusters should be placed to define the limits of the contaminant plume. The FFCA, SOW, Task 3b.7, calls for preparation of chemical concentration isopleth maps that extend offsite as necessary to identify areas of contaminant transport. DOE needs to ensure that there are a sufficient number of off-site wells to adequately characterize any plumes that may extend beyond the site boundary.

- Section 3.2.10, page I.3-11 - Background concentrations should also be established for radiological constituents. Since background data are needed for statistical and modeling purposes, a 100 series well in the 266/366 nest should be added (see Figure 3.3). A true 100 series upgradient well would aid in the contamination assessment.

° Section 3.2.12, page I.3-12, pagagraph 4 - Two additional wells are needed downgradient of the fly ash piles; one till well downgradient of fly ash pile #2 and one sand and gravel well downgradient of fly ash pile #1.

° Section 3.2.14, page I.3-13 - To provide additional upstream control on Paddy's Run and maintain groundwater upgradient control, it would be appropriate to install wells 266 and 366 adjacent to the creek itself. Also, by adding a 100 series well at this location, DOE could attain important information on the relationship between the creek and the waterbearing unit(s) within the till.

° Section 3.2.15, page I.3-14 - The locations of water level recorders in Paddy's Run is unclear. The relocated well nest 166/266/366 should be instrumented with water level recorders. Additionally, Paddy's Run should be monitored for flow (volume) both upstream and downstream of the areas of groundwater discharge/recharge. DOE should provide water level recorders at wells 109, 209, and 309.

° Section 3.2.17, page I.3-14 - Off-site wells to examine groundwater quantity are also required; they may be useful to resolve the contention that the Albright & Wilson well contamination arose from contamination in the aquifer, rather than intrusion of the company's materials into the well.

° Section 3.3.1, page I.3-15 - In the 11th line of the 1st paragraph, there is a reference to "the distribution constituent". DOE should define this term.

° Section 3.3.2, page I.3-15 - The plan does not explain how the augers will be decontaminated. Also, the phrase "auger boring borehole advancement" is redundant and should be reworded.

° Section 3.3.2, pages I.3-15, I.3-16 - The last sentence on page I.3-15 which continues onto the next page, describes removal of the drill cuttings. The plan should include a sentence that states the cuttings will also be containerized until analysis has been completed and that they will be disposed of properly.

° Section 3.3.2, page I.3-16 - The plan does not explain how drilling tools and casing will be decontaminated. It should also state that the decontamination fluids will be containerized and disposed of properly.

° Section 3.3.3, page I.3-16, 17 - This section proposes that PVC casings and screens be used for the monitoring wells. However, Task 3c of the SOW specified that the monitoring wells be constructed with teflon or stainless steel 316, not PVC. Although existing PVC wells are currently being used at the site, the new wells should be constructed to ensure unbiased results for the analyses of all hazardous substances being monitored. Since PVC pipe can adsorb and release trace amounts of various organic constituents, it should not be used when monitoring for organics. Additionally, the use of screens in excess of 10 feet in length may dilute the contaminant of interest. Therefore, screen lengths of 5-10 feet must be maintained. No cement grout mixtures should be placed in the saturated zone. Untreated bentonite slurries

may be used to seal the annulus in the saturated zone. This will prevent any effects of pH in the water chemistry caused by the contact of cement with groundwater. Sand pack materials, grouts, and cement should be analyzed at the same time as groundwater samples, not after the sample analysis is completed. The intermediate wells must extend five (5) feet above the water table to allow for seasonal fluctuations.

° Section 3.3.3, page I.3-17 - DOE should clarify and expand on its well development techniques. The plan should describe how pumping and flushing will be accomplished and how long it will continue. If any water is added during drilling, at least 5 times the amount of water added must be removed and 3 constant readings of pH, conductivity, and temperature obtained prior to ceasing development of the well.

° Section 3.3.5, page I.3-18 - In addition to the top of the well casing, land elevation should also be surveyed. The plan should indicate how this location will be marked. The plan does not indicate that the length of well casing stickup will be recorded in the field notebook.

° Section 3.4.1, page I.3-19 - Hermit data loggers can serve as the water level recorders recommended at other well locations, 166, 266, 366.

° Section 3.4.2, page I.3-19 - Well 103 is referred to in the text but is not shown on any of the figures. In light of the goals of the slug tests, the suggested additions to the well network and the concern over the groundwater/surface water connections, DOE should also perform slug tests on wells at the following locations: 166(266/366), 114, 165, and either 109 or 116.

° Section 3.4.2, page I.3-20, paragraph 1 - We would expect that any discharge from the site would comply with any applicable NPDES permitting requirements. Therefore add the following sentence to the end of this paragraph, "Any discharge will comply with all NPDES permit requirements and a NPDES permit will be in place prior to discharge. Any discharge which would exceed the discharge limits specified in the NPDES permit will be containerized."

° Section 3.5, pages I.3-20, I.3-21 - Procedures should describe how DOE will handle any water purged from the wells and how DOE will properly dispose of water after it is pulled from the well. The fourth bullet (page I.3-21) item is contradictory to purging procedures described on page I.3-20. The plan should specify that at least three well casing volumes will be removed, however, if pH, temperature, and specific conductance have not stabilized, purging will continue until they do.

° Section 3.5, page I.3-21, 8th bullet - Pumping rates should not exceed 100 milliliters per minute to prevent possible volatilization of organic contaminants.

° Section 3.5, page I.3-22, 1st bullet - Prior to purging or sampling a well, the equipment must be properly decontaminated. When inorganics are of concern, the equipment should be washed with nonphosphate detergent and rinsed with 0.1N hydrochloric acid or nitric acid, tap water, and distilled water. If organics are of concern, the equipment should be washed with nonphosphate detergent, and

rinsed with tap water, distilled water, acetone, and pesticide-quality hexane. It is unclear whether the equipment will be allowed to dry before being reassembled or wet and then wrapped in aluminum foil or some other inert material.

° Section 3.5, page I.3-22 - It is unclear whether the preservatives will be added prior to the sampling events. HSL organic samples and radiological samples must be preserved to a pH below 2.0. DOE should state how it will ensure that sufficient acid is placed in the bottle before the sample is added.

° Section 3.5, page I.3-23 - Line 6 of the 2nd paragraph on this page states that the bailer will be decontaminated under "more" controlled conditions, but does not explain what "more" means. In addition, the plan should state that the decontamination fluids will be containerized and disposed of properly.

° Sectin 3.8, page I.3-25 - In Table 3.2, the holding time for HSL base, etc. is "10/40a". However, the "a" footnote states extract within seven days. DOE should clarify this inconsistancy.

° Section 3.10, page I.3-26, paragraph 3 - The FFCA requires that DOE analyze all groundwater samples for HSL parameters. Since hazardous substances are not believed to be present in significant quantities in groundwater, a phased approach may be implemented. At a minimum, samples from the monitoring wells surrounding the waste pit area, sanitary landfill, and sludge pond area must be analyzed for HSL parameters (This statement excludes RCRA monitoring wells located adjacent to waste pit #4). The remaining wells may be sampled and analyzed for the proposed parameter list (i.e., radionuclides, drinking water standards, etc.) with the inclusion of Total Organic Halogen (TOX) and Total Organic Carbon. If elevated levels (above background) of pH, specific conductance TOX, or TOC are identified in these samples, then a subsequent HSL analysis shall be required.

° Section 3.10, page I.3-26, paragraph 4 - Pesticides must be included in the HSL analysis.

SUBSURFACE SOILS SAMPLING PLAN

General Comments

The FFCA calls for the construction of at least four hydrogeologic cross sections. This task should be specified in the plan. The plan should outline how past subsurface information was collected if DOE intends to use it to characterize the geology of the site.

Specific Comments

° Figure 4.2, page I.4-3 - Many of the proposed boring locations in this figure would make ideal locations for additional monitoring wells to fulfill the objectives stated in Section 3.2.2 (see comment on Section 3.2.2).

° Section 4.3, page I.4-4, paragraph 2 - The FFCA requires that continuous split spoon sampling be conducted during the boring program. A representative number of continuous cores must be collected such that the site geology may be adequately characterized. A minimum of ten continuous cores should be collected at the waste pit area alone.

° Section 4.3, page I.4-4, paragraph 4 - It is unclear whether DOE will collect two subsurface soil samples only if clay layers are present. Shelby tube samples should be collected of the "blue clay" for permeability testing and USCS soil classification.

° Section 4.4, page I.4-5, paragrpah 1 - This section states that a full HSL analysis is contingent upon the sample having unusual or visual evidence of organic or inorganic contamination, or a high reading for volatile organics. DOE should run a full HSL analysis on a minimum number of samples even if no samples meet the criteria listed above, because inorganic contamination present may not be visible.

° Section 4.4, page I.4-5, paragraph 2 - What is the justification for using 3 standard deviations over background as a criteria for lab analysis of soils? On Page I.5-15, Section 5.7.2, the criteria for lab analysis is twice background. Why is that criteria different than the one proposed in this paragraph? The U.S. EPA recommends a consistent criteria of twice background (e.g., if background is 100 cpm, anything over 200 cpm is an analysis candidate).

Also there is lack of clarity here as to whether the excess over background or a multiple of background will be used as the action criteria (e.g. 20 uR/hr over background of 10 uR/hr or 2 times background, 20 uR/hr).

° Section 4.7.1, page I.4-6 - DOE must take at least one sample from each horizon per location for complete radiological analysis.

° Section 4.7.3, page I.4-8 - The number of samples should be specified as a minimum of 20.

° Section 4.7.4, page I.4-9 - At least two samples per borehole which meet one or both of the criteria specified in this section should be subjected to a

full HSL analysis. This section also appears to be contradictory to the last paragraph of Section 4.2.1.4 on page 4-14 of the Work Plan which states that a composite sample from each borehole from the new till wells will be tested for HSL parameters.

SURFACE WATER AND SEDIMENT SAMPLING PLAN

General Comments

In the past, the Great Miami River and Paddy's Run Creek both received discharges of waste from the FMPC. Since the practice has occurred for a number of years, there is a fundamental need to know the full extent of contamination, both radiological contaminants and hazardous substances. The proposed work does not involve investigations of the flood plains associated with the above-mentioned waterways to assess long-term accumulation. Sediment sampling is generally too sparse, specifically, there are no sampling points in the three mile section between FMPC effluent discharge to the town of New Baltimore. Additionally, planned river bottom sediment sampling protocols will not identify peak concentrations of contaminants in the low flow, high depositional areas where recreational users are most likely to come in contact with them.

Specific Comments

° Section 5.1, page I.5-1, paragraph 1, 5th bullet - Radiological components are improperly omitted from this objective.

° Section 5.1, page I.5-1, paragraph 2 - The fifth sentence of this paragraph should indicate that the "point in time" at which sampling will occur will attempt to capture the first flush of a significant rainfall event.

° Table 5-1, pages I.5-2, I.5-3, I.5-4 - The sediment samples from the Great Miami River, Paddy's Run, the storm water outfall ditch, main effluent line (manhole 175), clear well, pits 4 and 5, the south lime sludge pond, and the drainages from the upper fly ash pile should be tested on at least one occasion for HSL parameters. These contaminants may concentrate in sediments, where they could exist at levels of concern, yet be undetected in the water column.

The descriptions for the Great Miami River sampling locations in Table 5.2 do not match the text in Section 5.2.1. The text states that three (not five) sediment locations will be sampled quarterly for uranium, gross alpha and beta, and Radium-226 and 228. The text also states that quarterly sediemnt samples will be collected at two (not one) locations for full radiological analysis and grain size. Additionally, the text describes three surface water sampling locations, but the table does not specify how many locations.

Proposed samples must be collected as close in time as possible. The unsynchronized sample schedule for FMPC's normal environmental samples has made intercomparisons extremely difficult.

The plan must include proposed gross alpha and gross beta levels that will trigger an isotopic measurement of surface water and sediment samples.

° Section 5.1, page I.5-5, paragraphs 1 and 2 - These paragraphs mention that a separate site investigation will measure chemical constituent (including HSL compounds) of the waste pits. This separate investigation should either be described more completely or be specifically referenced.

If soil borings or surface soil samples onsite, especially around the waste pits, show the presence of organic compounds, then sediments from Paddy's Run and the Great Miami River will have to be resampled and analyzed for the complete list of HSL organics. There also seems to be some contradiction regarding the analysis (or lack of analysis) of HSL parameters between this section and Section 4.2.1.6 (page 4-19) of the Work Plan which states that half of the surface water and sediment samples will be analyzed for HSL and additional site-specific parameters. Please clarify this.

° Section 5.1, page I.5-5, paragraph 2 - If the screening criteria of Section 5.7.2 are used to determine the locations of sampling, they will be far too coarse (too lenient). Screening should occur at 10 pCi/gm.

° Section 5.2.1, page I.5-5, 6, 7 - No sampling stations exist on the Great Miami River immediately below either the FMPC effluent outfall or the confluence with Paddy's Run. As one of the objectives of the remedial investigation is to determine the significance of FMPC as a source of pollutants to the Great Miami River, sampling stations need to be located on the river so as to demonstrate the effect of potential sources. Existing stations W3 and W4 are most likely too far downstream from the potential influence of FMPC to demonstrate any effect. New downstream stations should be established in close proximity, yet providing for allowable mixing, of the effluent outfall and the confluence with Paddy's Run.

The final paragraph in this section (Page I.5-7) discusses sediment sampling. Sediment samples should be collected from areas near the surface water sampling locations if the surface water stations are not within depositional areas. The additional depositional area samples proposed in the text should also be tested for HSL parameters.

The proposal is to add two additional sediment sampling points along a 10 mile length of the Great Miami River between the FMPC discharge and Miamitown. This will give a total of three. Where will these be located? Unless one is located near the discharge, valuable information will not be obtained. Three sampling points over 10 miles is too few for a Remedial Investigation.

The 1st paragraph on page I.5-7 describes two additional sediment sampling locations on the Great Miami River between the main effluent discharge and location W3 (the plan incorrectly lists W4). Surface water samples for full radiological and chemical analyses should also be collected at these two locations.

In the 4th paragraph of page I.5-7, sampling point W5 should be used as both a surface water and a sediment background site.

° Section 5.2.2, page I.5-7 - This paragraph states that surface water samples will be collected at W10 (downstream of the waste storage area) and W7 (downstream of the storm water outfall ditch). There is no way to evaluate the effects of the waste storage area and outfall ditch on the water quality in Paddy's Run without collecting a sample upstream of these locations. Sampling location W5 should be added and mentioned in this part of the plan.

° Section 5.2.3, page I.5-8, paragraph 2, 3 - The criteria or guidelines to be used for sample site selection (water and sediments) in the storm water outfall ditch should be provided. The FFCA requires continuous water monitoring at the Paddy's Run discharge point. This sampler should be installed as was agreed upon so it is available to add data to the Remedial Investigation.

The plan calls for sampling during a storm event but does not state when during the storm event sampling will occur. Contaminant levels may be influenced by a first flush effect; samples should be collected from the first flush.

The plan should include a map showing the sampling locations along the storm water outfall ditch and the criteria for selection should be defined. This comment also applies to all sampling locations discussed in Sections 5.2.5 through 5.2.8 of the plan.

° Section 5.2.4, page I.5-8, 9 - The term "surface water" in both the first and second paragraphs should be replaced in all cases with either "effluent" or "wastewater". Both sediments and effluent samples should be analyzed for HSL parameters.

In addition, we would suggest that toxicity testing of the effluent for acute and chronic effects on aquatic organisms accompany the other analyses. We would be happy to provide detailed guidance on the selection and use of particular toxicity test techniques, if requested.

° Section 5.2.5, page I.5-9 - Flow measurements should be made at the same time that water quality samples are collected. Water levels in the clear well and the pit should be measured when water samples are collected. This comment also applies to the first paragraph of Section 5.2.6.

The final paragraph of this section indicates that sediment and waste analyses are being conducted separately by a contractor and need not be duplicated. The sampling plan should indicate the parameters being analyzed by the contractor so we can determine if the list is sufficient for the RI. The methodology QA/QC of the contractor should also be compared against the requirements for the RI. U.S. EPA must be assured of the quality of the data.

° Section 5.2.6, page I.5-9 - The 1st paragraph provides DOE's rationale for collecting TOC, TOX, and groundwater quality parameter samples in pit 4 and the south lime sludge pond. The plan should also state why these samples will not be collected for pit 6. The 2nd comment in Section 5.2.5 above applies to the last paragraph of this section.

° Section 5.2.7, page I.5-10, 11 - The sampling program for miscellaneous drainages in the waste storage area does not include chemical analyses (TOC, TOX, general water quality parameters). At a minimum, the plan should provide DOE's justification for not collecting these samples.

The stated goal of the drainage sampling program described in Section 5.2.7 is "source identification". However, the number of samples to be collected (generally two to three samples per location) is not sufficient for this

purpose. For several sampling locations, the plan states that samples will be collected if standing or flowing water is present. The plan should state that sediment samples will be collected whether or not water is present.

The following sentence should be added to paragraph 1 following the 3rd sentence in the existing text:

> Sampling of these drainage ways will be conducted during significant rainfall events; attempts will be made to collect from the first flush of runoff.

Appropriate modification should be made in the text of each bullet item to reflect the above sampling constraint. Also, generic criteria for sampling site selection (specific criteria, if possible) should be identified (for example, the second bullet on page I.5-10 and the fourth bullet on page I.5-11).

° Section 5.2.7, page I.5-11 - In the section on drainage from fly ash piles, DOE states that additional sampling locations will be selected in the field. The plan should describe the selection criteria that DOE will use to choose these locations.

° Section 5.2.8, page I.5-11 - The comments regarding sampling of the waste storage area (first and second comments for page I.5-10) also apply to the sampling program for drainage features in the production area.

° Section 5.3.2, page I.5-12, paragraph 1 - Compositing sediment samples collected at points 0/4, 1/4, 1/2, 3/4, 4/4 across the Great Miami River will obscure information about the peak sediment concentrations. Peak levels will probably occur in the shallow water near the inside of the bank where recreational river users are most likely to come in contact with it. Samples should not be composited. Decontamination procedures should be fully described. The 3rd paragraph states that sampling will proceed from downstream to upstream locations. If this is the case, decontamination of equipment between sampling stations is especially important.

° Section 5.3.2, page I.5-12 - When sediment sampling locations are selected the emphasis should be on collecting samples from depositional areas as opposed to sampling at quarterpoints across the channel (see last sentence of first paragraph in section). The latter methodology probably will preferentially sample scour areas, which would bias the results toward appearing clean. We suggest, at this point in the sediment/surface water sampling, a conservative approach, designed to look for contamination where it is most likely to exist.

This 2nd paragraph needs clarification. The term "shift" needs clarification; will more than one shift be run?

° Section 5.7.1, page I.5-13 - This paragraph states that field sample splits, field blanks, and blind duplicates will be collected at a frequency of 10 to 15 percent. The plan should clarify whether this is the total frequency for all three types of QC samples or the frequency for each individual type.

° Table 5-2, page I.5-14 - This table contains several discrepancies in preservation methods and holding times when checked against the RCRA Groundwater Monitoring Enforcement Guidance Document (TEGD) and Test Methods for Evaluating Solid Waste (SW-846). The corrected versions are listed in Table 1 along with the reference for the correction.

° Section 5.7.2, page I.5-15 - The action level for sediments is twice background. The action level for subsurface soils is 3 standard deviations above background (Page I.4-5, para. 2). The U.S. EPA recommends a consistent level at twice background. Clarification is also needed to identify how the trigger level be computed? For example, if background is 10 uR/hr, will the trigger level be 20 uR/hr (gross counts twice background) or 30 uR/hr (net counts are twice background). Is the standard deviation referred to for background only?

° Section 5.8, page I.5-15, 16 - The TOX (total organic halides) analysis is apparently proposed as a surrogate for gas chromatography/mass spectrometry (GC/MS). If TOX analysis is used, individual organic chemicals will not be identified and quantified, so the results will not be directly useful in assessing Ohio water quality standards violations, or in comparing results to EPA water quality criteria. The TOX analysis may be useful, however, as a screening technique provided the technique is sensitive for the full range of organic pollutants in the contract laboratory program (CLP) list (see page 10, number c.4, of Attachment I to the FFCA) and a plan is developed for GC/MS analyses should TOX results exceed an agreed upon trigger level. Unless these two criteria are met, based upon demonstrations provided to U.S. EPA, a GC/MS must be used for all organic analyses.

The metals; copper, nickel, and molybdenum should be added to the general water quality parameters list on page I.5-16. These metals are regulated under the effluent guidelines for the nonferrous metal manufacturing and forming point source categories (which cover FMPC operations) and may reasonably be expected to occur in wastes resulting from production process at FMPC.

BIOLOGICAL RESOURCES SAMPLING PLAN

Specific Comments

° Section 6.1, page I.6-1 - The existing list of objectives does not appear to cover the requirement to "...evaluate the impacts of the contaminants on the floral and faunal communities in the surface water sediments and adjacent wetlands", (see page 10, Section E, of Attachment I to the FFCA. Such a task should be included in the biological resources sampling plan and appropriate objectives and activities added. If not already done, the comprehensive water quality review for the Great Miami River, completed by OEPA in 1985, should be reviewed for background information and study techniques.

° Section 6.3.1.1, page I.6-1 - This paragraph explains the procedure for collecting vegetation samples. The second and third lines state that the vegetation sample will be placed in a glass jar and then in a "sample container". Will the glass jar actually be put into another similar container or a shipping container? Please clarify this.

° Section 6.3.1.2, page I.6-3 - The second paragraph describes the procedures for collecting terrestrial wildlife samples. Several deficiencies have been identified. First, the plan should explain how the animal will be exterminated before it is "placed" into the glass jar. Second, the plan should describe the size of sample jars that will be used. Third, DOE should explain why the glass jar will be placed into a "sample container". Perhaps this should read "shipping container". If not, DOE should explain the purpose of putting the specimen into two sample containers. Fourth, DOE should explain how long faunal species will be collected (that is, over 1 or 2 days, 1 or 2 weeks, or longer). Last, since several of the radioactive particles (strontium and radium) have an affinity for the skeleton, the skeleton should be analyzed. All the organs listed (liver, kidney, and gonad) should also be analyzed. If all of these organs are not analyzed, at least one of these organs should be analyzed for all animals. This will make analytical results more comparable.

° Section 6.3.1.3, page I.6-3 - This section explains the procedure for collecting aquatic organisms. The plan does not state how smaller game fish will be prepared for analysis, nor if the internal organs of these fish will be analyzed separately from the flesh. In addition, DOE should explain how long the electroshock will be applied in the water or how long the net will be dragged in the water.

  The method of macroinvertebrate sample collection should be defined. It should be sufficient to qualitatively and quantitatively characterize the benthic community. DOE should clarify the meaning of "samples of benthic macroinvertebrates". It is unclear whether the samples will be parts of one organism or several organisms.

° Figure 6.1, page I.6-4 - This figure appears to include a shaded area that is not explained in the legend. This area is north and east of the intersection of Cincinnati-Brookfield Road, Layhigh Road, and Route 128.

- Section 6.3.2, page I.6-5, 2nd bullet - "Down-gradient" should be down-wind since the text is referring to agricultural crop and garden sampling.

- Section 6.3.2, page I.6-6, 1st bullet - DOE should clarify this sentence to mean that tissue from animals will be sampled, not tissue from contaminated sites. Also, clarification is needed on whether "three samples" means three samples consisting of one animal per sample or "three samples" consisting of several animals per sample.

- Section 6.3.2, page I.6-6, 3rd bullet - Three samples of fish tissue should be analyzed from each surface water sampling location in both Paddy's Run and the Great Miami River.

- Section 6.3.3, page I.6-6 - DOE should clarify this section to indicate if the triplicate sample will be collected in 1 day or 1 week and if one sample will be collected once in each of the specifed months.

- Section 6.3.5, page I.6-7 - In the 1st sentence, DOE should delete the comma after "glass jars" and insert it after "Teflon-lined lids". In addition, rather than referring to the QAPP, DOE should explain in this plan how samples will be transported to the laboratory. The plan should refer to the QAPP only for details.

- Section 6.3.6, page I.6-7 - Bioaccumulation may result in elevated contaminant levels in tissues when the same contaminants are unapparent in soil, sediment, or water samples. In addition, especially for terrestrial animals, it is difficult to ensure that the soils sampled represent the exposure affecting the animal. Therefore, tissues should not be strictly limited to those parameters present above background in soils and sediments. Rather the CLP paramenters that may be expected to bioaccumulate should be analyzed in a subset of terrestrial and aquatic organisms that, due to location of capture/ sampling are most likely to be contaminated.

  In addition, the aquatic organisms, particularly the benthos, should be qualitatively analyzed to assess the impact of contamination on the aquatic community structure.

FACILITIES TESTING PLAN

General Comments

The objective of the facility testing plan is to determine if leakage has occurred from the underground storage tanks and the main effluent line (which includes only the section from the wastewater treatment plant to the Great Miami River). This section does not address the testing of the following units which are included in Section 4.2.1.10 of the work plan:

- Line from the Clear Well to manhole 175
- Production storage pads
- Hazardous Waste storage tanks
- Dikes
- Ancillary below ground piping
- Sumps

° Section 7.3, page I.7-1 - The concrete trench that once fed slurry to the K-65 tanks should also be an item of study. Although it is not operational now it may have been a significant contributor to soil contamination in the past, just as the Buried Effluent Line to the Great Miami River is a potential source today. Certainly the trench to the K-65 tanks carried much higher levels of radioactivity.

° Section 7.4, page I.7-5 - The plan indicates that flow measurement devices will be weirs or ultrasonic flow meters. DOE could consider a more accurate method for determining the condition of the effluent line, such as blocking off a section of pipeline, filling the unit with water, and measuring the change in water elevation in the upstream manhole. This method may be appropriate and would ensure that leaks are detected. However, the line has been in service for 36 years and can be expected to leak. It may be more cost effective to televise the pipeline and make the needed repairs.

° Section 7.5, page I.7-6 - The 1st paragraph includes the phrase, "...a loss or gain of 15 percent of the flow in the pipe..." DOE should describe the rationale for determining the 15 percent criteria. DOE should also address the accuracy of the flow measurement equipment.

QUALITY ASSURANCE PROJECT PLAN

Project Description

General Comments

This Section should provide all data collected in the past studies (in summary form, please) so that the QAPP can be evaluated to determine whether the RI would provide all the necessary information to conduct the FS.

This Section should also provide information on the types of samples (e.g., water, groundwater, sediment, tissue) that were collected and the parameters that were analyzed in the previous monitoring activities.

Specific Comments

° Section 2.0, page 1, paragraph 2 There is an inconsistency in the analytical laboratories selected. The 45 Day Deliverable states that IT analytical laboratories Knoxville, Tennessee and Roy F. Weston analytical laboratory, Lionville, Pennsylvania will perform the analyses. Section 2 identified IT Laboratory in Export, Pennsylvania, and IT/RSL in Oak Ridge, Tennessee.

  Please identify the laboratories (including self contractors) which will actually be performing the analyses consistent throughout the Quality Assurance Project Plan. The laboratory must be a certified CLP laboratory or undergo a U.S. EPA audit.

Ouality Assurance Program

General Comments

This Section should provide, for each matrix, projected sampling activities, such as number of samples to be collected and analyzed for what contaminants, and number of samples to be collected for quality control activities (e.g., field/trip blank and duplicates and spikes).

Page 19 is illegible. Please submit a readable copy.

Field Procedures

Specific Comments

° Section 5.2, page 27, 2nd bullet - No drilling muds should be used. Any water added to the hole to aid in drilling should be analyzed prior to its introduction to the borehole.

- Section 5.2, page 27, 6th bullet - This item does not make any sense, clarification is needed.

- Section 5.2, page 28, last bullet - Only air rotary drilling should be used for holes advanced into bedrock.

- Section 5.2, page 30, 2nd bullet - The soil sampling procedures outlined here are inconsistent with those found in the sampling plan. At a minimum, soil samples should be collected at 5 foot intervals or at any change in lithology. However, a sufficient number of continuous cores must be completed to adequately characterize the geology of the site. This modification should be made in the appropriate sections of the sampling plan such that it's consistent with the QAPP.

- Section 5.3, page 34, 2nd bullet - Well screens should not exceed 10 feet in length. This will minimize the potential for dilution of a particular contaminant.

- Section 5.3, page 34, 5th bullet - No cement grout should be placed in the saturated zone. An untreated bentonite slurry should be placed above the pellets to a level above saturated conditions.

- Section 5.3, page 37, 8th bullet - The sand pack should not exceed more than 4 feet above the well screen.

- Section 5.4, page 38, 2nd bullet - Absolutely no mud should be used during well drilling.

- Figure 5.13, page 41 - This page is illegible. Please submit a readable copy.

Sample Collection Procedures

General Comments

The sample preservation procedures for HSL organic analyses (e.g., use of chemicals) are not in conformance with the CLP sample collection and preservation procedures. The Section should specify how Pesticides/PCBs samples would be collected and preserved until ready for extraction.

The Sampling Plan of Task 2 Report, specifies certain criteria that are to be used before sending soils, animal, and plant tissues to a CLP laboratory for analysis. Section 6 fails to address sensitivity levels of the field instruments for the HSL parameters (e.g. if U.S. EPA submits unknown soil samples to field personnel for field screening, could they detect the presence of toxic pollutants just based on the field observations (color, odor, or response to the field screening instruments)?

DOE should provide U.S. EPA the pertinent QA manuals referred in this Section for our review. More information is needed on what NBS SRMs are to be used to calibrate each field instrument. What is ALS-HP-003 of the IT QA Manual?

Specific Comments

- Section 6.1, page 4, 1st bullet - Sampling equipment must undergo complete decontamination prior to sampling new wells. When inorganics are of concern, equipment should be washed with a nonphosphate detergent and rinsed with dilute (0.1 N) hydrochloric acid, tap water, and distilled water. When organics are of concern, the equipment should be washed with a nonphosphate detergent and rinsed with tap water, distilled water, acetone, and pesticide quality hexane.

- Section 6.1.1, page 7, 1st bullet - pH papers are not a very sensitive indicator of pH. There will apparently be a pH meter at the site. It is recommended that this be used.

- Section 6.1.1, page 8, 1st bullet - Radionuclide parameters are preserved with HNO3. They should not be filtered. If results from a filtered sample are desired, an unfiltered sample should also be analyzed.

- Section 6.5, page 17, 5th bullet - Sediment samplers must be decontaminated following the corrected procedures for groundwater sampling equipment (see comments on page 4, 1st bullet, of this section).

- Section 6.6, page 19, 1st bullet - Split spoon samplers should be decontaminaed following the corrected procedures for groundwater sampling equipment if they are to undergo HSL analysis.

- Section 6.7.2, page 21, pagargaph 3, 3rd bullet - The QAPP states "Specify the quantity of detectors desired. This should include enough to install a minimum of two detectors per location and at least ten detectors (optional) for known exposures and background determinations." The word "optional" is not satisfactory. This word should be eliminated.

- Table 6-5, pages 41-44 - Hexavalent chromium is mentioned at various places in the document, but it is not included in this Table. This holding time for hexavalent chromium is 24 hours.

Equipment Calibration/Maintenance

Specific Comments

- Table 8-1, page 3 - This page is illegible. Please submit a readable copy.

Laboratory Analytical Procedures

General Comments

The GC/MS and GC procedures do not address test procedures (e.g., tailing factors, or endrin breakdown products, etc.) to be used to evaluate the performances of the analytical columns.

This Section should provide organic and inorganic test procedures, in detail, to be used for the analysis of animal and plant tissues since there are no CLP procedures for these matrices.

Data Reduction, Validation, and Reporting

General Comments

The laboratory should submit all CLP HSL parameters data in the same format and in the same sequence as specified in Deliverable Index and Reporting Schedule of the CLP IFB's.

Quality Assurance Audits

General Comments

Is this an internal Quality Assurance Audit Plan? The Section refers to check lists which should be used by the auditors. The Quality Assurance Office, U.S. EPA does not necessarily use check sheets. A laboratory is evaluated for conformance with methodology as specified in the OAPP and other laboratory/field activities at the discretion of the evaluator.

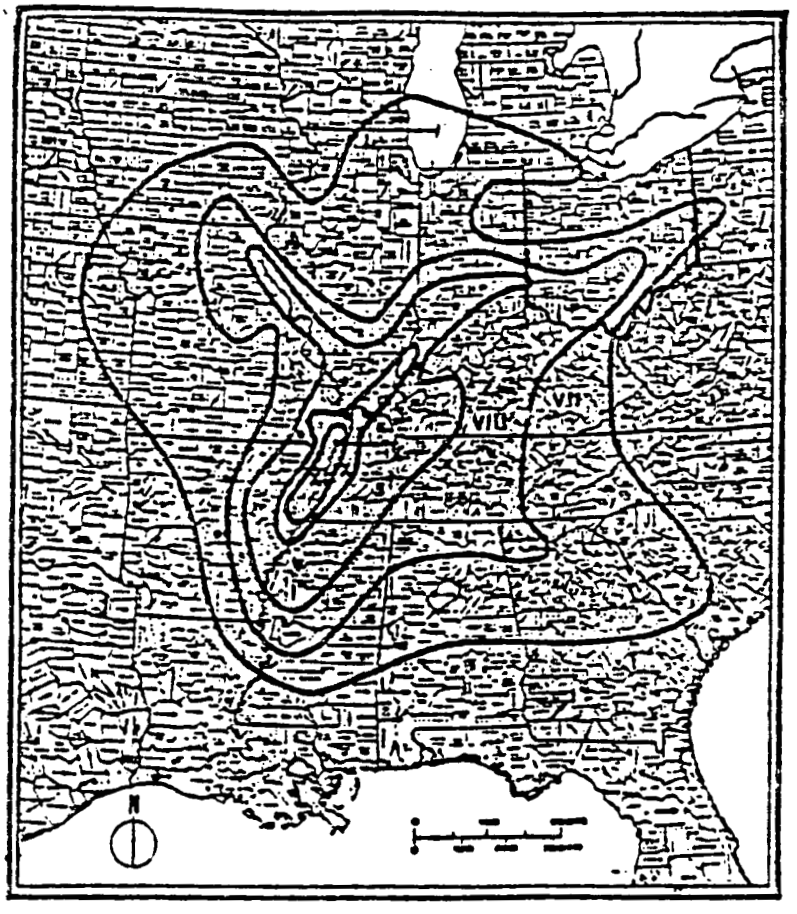
Apendix C, Radiological Methodology and Procedures

General Comments

The procedures described are those used at Applied Science Laboratory, Inc. Will these same procedures be used by the laboratories specified in the 45 Day Deliverable. If not, procedures used by the designated laboratories should be provided.

5915

ESTIMATION OF EARTHQUAKE EFFECTS ASSOCIATED WITH A GREAT EARTHQUAKE IN THE NEW MADRID SEISMIC ZONE



ATTACHMENT 1

CENTRAL UNITED STATES EARTHQUAKE PREPAREDNESS PROJEC (CUSEPP)

CUSEPP REPORT NUMBER 82-3 000043

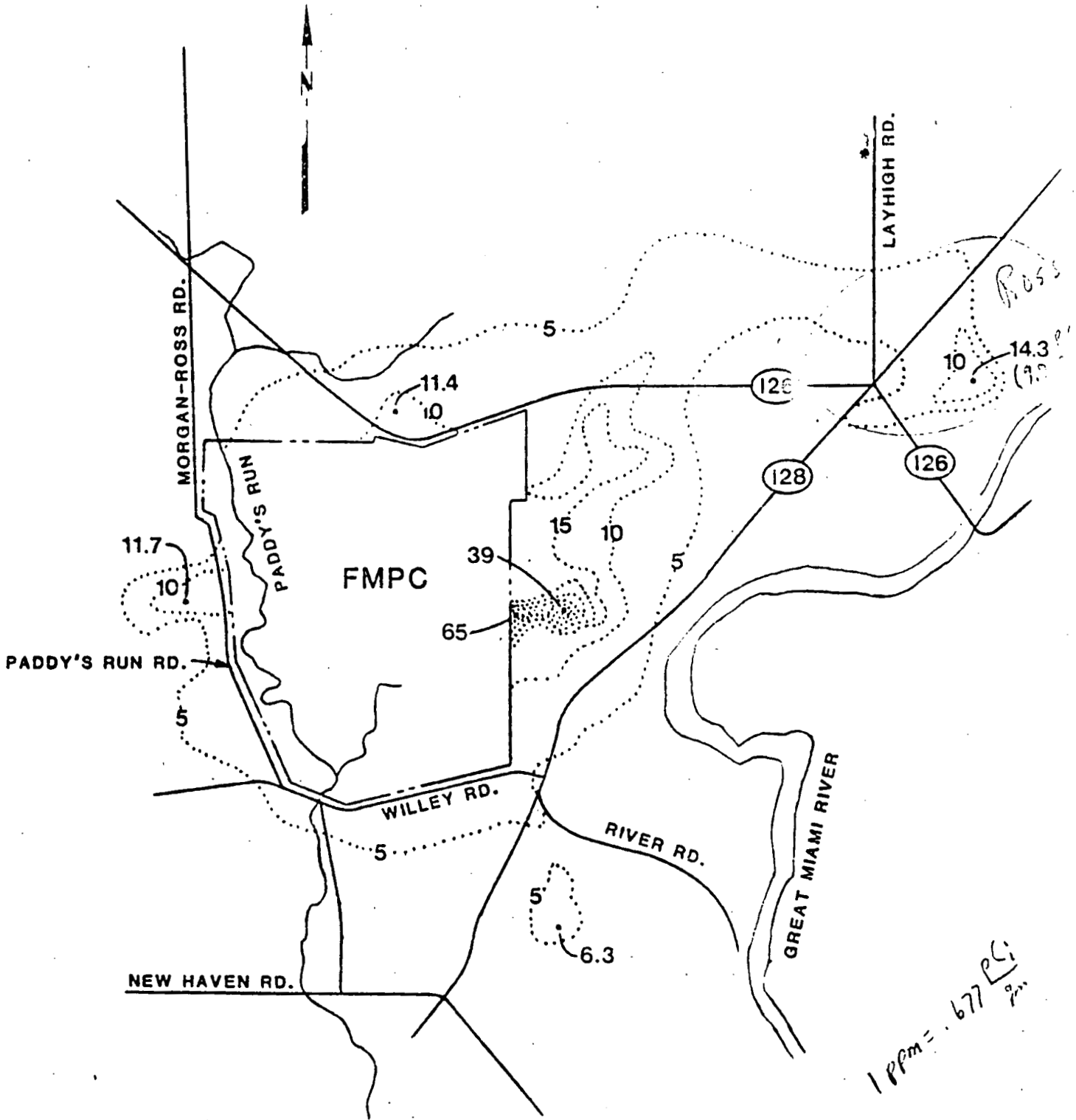


FIGURE 7 Uranium Levels in Soils Adjacent to the FMPC

ATTACHMENT 2

000044

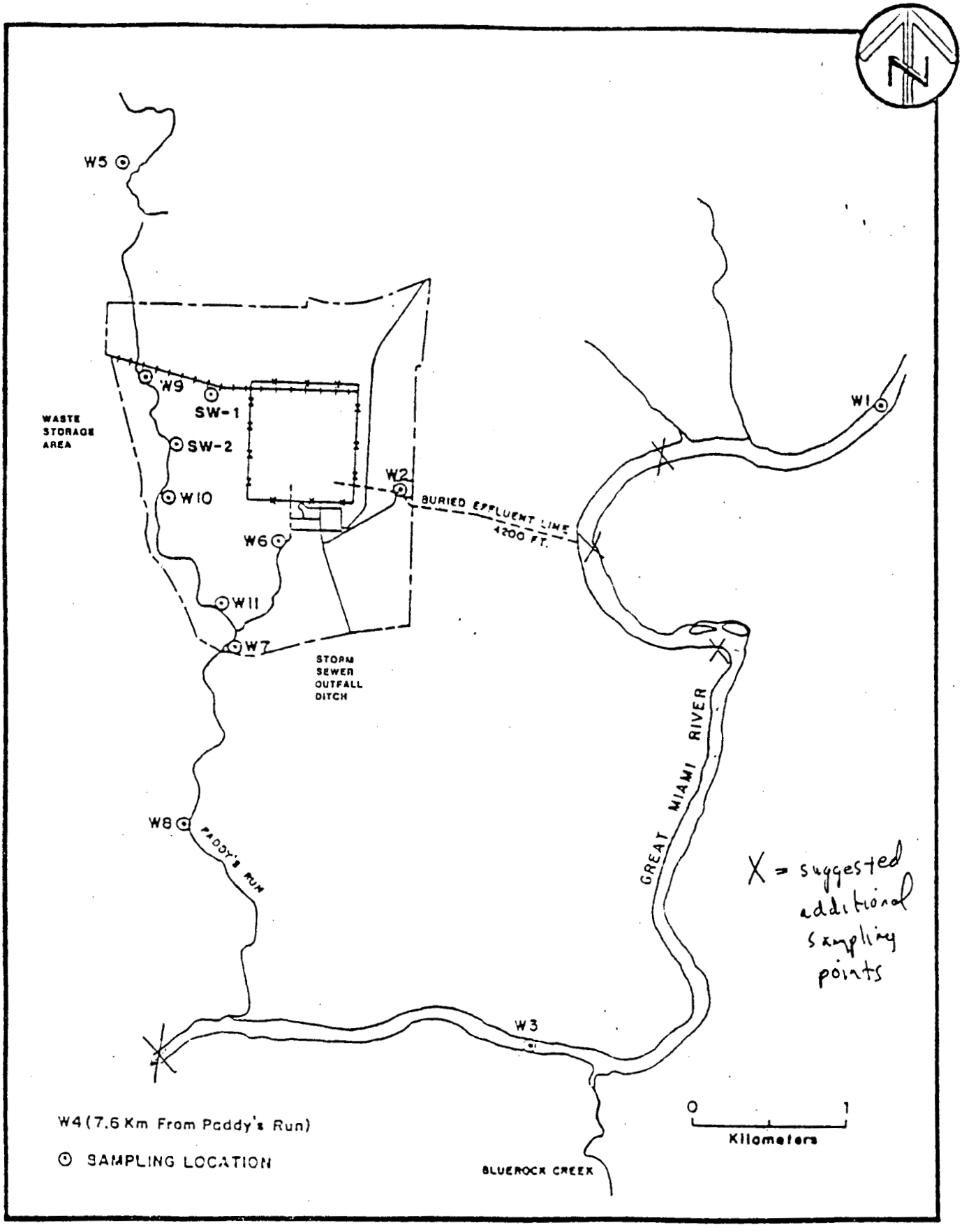


FIGURE 4.6

SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

ATTACHMENT 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 2 1987

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Radiation Recommendations on NFSS Residues

FROM: Sheldon Meyers, Director
Office of Radiation Programs (ANR-458)

TO: Conrad Simon, Director
Air & Waste Management Division, EPA/Region 2

We have reviewed the letter of November 4, 1986, from G. P. Turi, U.S. Department of Energy (DOE), to F. J. Bradley, New York Department of Labor, which you recently forwarded to us. That letter advises that the K-65 residues at the Niagara Falls Storage Site (NFSS) have been newly determined to have an average radium-226 concentration of 520 nCi/g. This is in contrast to the value of 67 nCi/g for which we provided guidance in my previous memorandum on this subject (June 9, 1986; copy attached).

In that memorandum we commented that wastes containing 67 nCi/g radium-226 pose hazards which fall just short of those qualifying transuranic wastes for coverage under the Environmental Protection Agency's (EPA's) Environmental Standards for Management and Disposal of Spent Nuclear Fuel, High Level, and Transuranic Radioactive Wastes (40 CFR Part 191). This new information indicates that the K-65 residues exceed the 100 nCi/g criterion specified in those standards for transuranic wastes by more than a factor of 5. If this is indeed the case, we can, at present, see no justification for not treating the K-65 wastes in accordance with the management and disposal provisions of 40 CFR 191.

Accordingly, it would be appropriate to obtain assurance from the DOE that:

1. the K-65 residues will be maintained isolated from other wastes at NFSS;

2. the provisions of Subpart A of 40 CFR Part 191 are satisfied by the interim storage site; and

3. the K-65 wastes will be disposed of in conformance with Subpart B of 40 CFR 191 as soon as a suitable repository is available.

ATTACHMENT 4
3/6

DEC 1 1986

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Radiation Recommendations on NFSS Residues

Conrad Simon, Director
Air & Waste Management Division

Herbert Barrack
Assistant Regional Administrator for Policy & Management

Allan Richardson of the Office of Radiation Programs (ORP) and I conferred by telephone concerning the Niagara Falls Storage Site (NFSS). Based on our discussion, we arrived at a position concerning NFSS whereby not only do we seek increased intruder protection, but that the residue material should be handled as a transuranic waste. This change in position is based on the latest information concerning residues with concentrations of up to 500 nCi/g. This activity would place the material at 5 times the limits of 40 CFR 191.02 for high level alpha-emitting transuranic wastes. While this material is radium and therefore not a transuranic, we do not see any reason why the Department of Energy (DOE) should not treat these residues in the same manner as an alpha-emitting transuranic waste since radium is an equally hazardous alpha-emitter. It will be up to the DOE to show some valid reasons why this material should not be treated as high level waste. ORP will be transmitting written comments on this material shortly.

Assuming that DOE is unable to provide a rationale for not treating this material as high level waste, then EPA should try to get agreement from DOE on the following issues:

1) A committment from DOE to move the residues as soon as a repository is available. This might be the Waste Isolation Pilot Project (WIPP), but could require storage until a high level waste repository is completed. (In this case the interim storage could be a matter of several decades.)

2) A study to assure that there will be no contamination of groundwater during this interim storage.

3) DOE guarantee that they will maintain ownership and control over the sight and restrict access to the site until the residues are removed.

In any future correspondence on the residues we should refer to the actual concentration of the individual residues and not the average concentration of the residues. The DOE will be reminded that blending of high level wastes to arrive at a lower waste classification is not appropriate.

Mr. Richardson has offered to call Ms. Turri of the DOE to discuss the situation if we would like. He might also be able to attend the proposed review meeting with the DOE in December if NFSS will be a major topic on the agenda. Please have someone of your staff contact Paul Giardina at 4418 to discuss this matter.

cc: Allan Richardson, ORP/ANR-460
Paul Giardina, ANR-RAD
Barbara Pastalove, OPM-FI
Warren Black, WMD-HWP
Robert Hargrove, OPM-FI
Sandy Williams, OFA
Larry Jensen, Region V

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5915

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 9 1986

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Niagara Falls Storage Site (NFSS) Final EIS Support to Region 2 and U.S. Department of Energy

FROM: Sheldon Meyers, Acting Director
Office of Radiation Programs (ANR-458)
Original signed by David E. Janes

TO: Conrad Simon, Director
Air and Waste Management Division, Region 2

On Friday, May 30, 1986, I discussed with Paul Giardina the possibility of providing advice from the Office of Radiation Programs (ORP) regarding the U.S. Department of Energy (DOE) Final EIS for NFSS. It is my understanding that the Region 2 Office, in consultation with ORP's Criteria and Standards Division, has identified the need to advise DOE regarding radiation protection requirements for disposal of approximately 11,000 m^3 of radioactive wastes from the processing of uranium ores at the NFSS site, and that these wastes have an average radium-226 concentration of 67,000 pCi/g. These wastes, known as the K-65 residues, are much hotter than normal uranium mill tailings and therefore will clearly require more enhanced protection than uranium mill tailings.

The NFSS Final EIS is part of the overall DOE Formerly Utilized Sites Remedial Action Program (FUSRAP). In the past, ORP has consulted with DOE on FUSRAP and provided additional or supplemental advice on radiation requirements for special cases. Clearly, this case is special. We currently have underway an extensive rulemaking for low-level wastes and have recently promulgated final standards for high-level radioactive wastes. The NFSS wastes pose hazards just short of those considered by the high-level waste standard, and therefore fall just within the scope of the low-level waste standards program. We will be available to meet with DOE to discuss the waste materials in question within the context of this standards program. We do, however, ask that this be carefully scheduled since our indoor radon workload has put serious time constraints on our ability to perform assistance projects such as this.

cc: Christopher Daggett, RA/Region 2
Herbert Barrack, OPM/Region 2
Paul A. Giardina, EPA/Region 2
Allan C.B. Richardson, CSD/ORP (ANR-460)

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The balance of residues (L-30 and F-32) at NFSS have an average concentration of 12,000 pCi/g. They are thus still one to two orders of magnitude more radioactive than the uranium mill tailings for which the provisions of 40 CFR Part 192 were developed. It is therefore appropriate to provide improved protection against intrusion (beyond that provided by Part 192) commensurate with this greater hazard.

If you wish further clarification regarding the application of these standards to this situation, Allan C.B. Richardson, Chief, Guides and Criteria Branch, of my office, is the appropriate contact. Mr. Richardson can be reached at FTS 475-9620.

Attachment

cc: Herbert Barrack, EPA/Region 2
William Muszynski, DRA/Region 2
Paul A. Giardina, EPA/Region 2
Raymond A. Brandwein, OD/ORP (ANR-458)

Federal Register

Thursday
September 19, 1985

5915

Part II

Environmental Protection Agency

40 CFR Part 191

Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 191

[AH-FRL 2870-3]

Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is promulgating generally applicable environmental standards for the management and disposal of spent nuclear fuel and high-level and transuranic radioactive wastes. The standards apply to management and disposal of such materials generated by activities regulated by the Nuclear Regulatory Commission (NRC) and to disposal of similar materials generated by atomic energy defense activities under the jurisdiction of the Department of Energy (DOE). These standards have been developed pursuant to the Agency's authorities and responsibilities under the Atomic Energy Act of 1954, as amended; Reorganization Plan No. 3 of 1970; and the Nuclear Waste Policy Act of 1982.

Subpart A of these standards limits the radiation exposure of members of the public from the management and storage of spent fuel or high-level or transuranic wastes prior to disposal at waste management and disposal facilities regulated by the NRC. Subpart A also limits the radiation exposures to members of the public from waste emplacement and storage operations at DOE disposal facilities that are not regulated by the NRC.

Subpart B establishes several different types of requirements for disposal of these materials. The primary standards for disposal are long-term containment requirements that limit projected releases of radioactivity to the accessible environment for 10,000 years after disposal. These release limits should insure that risks to future generations from disposal of these wastes will be no greater than the risks that would have existed if the uranium ore used to create the wastes had not been mined to begin with. A set of six qualitative assurance requirements is an equally important element of Subpart B designed to provide adequate confidence that the containment requirements will be met. The third set of requirements are limitations on exposures to individual members of the public for 1,000 years after disposal. Finally, a set of ground water protection requirements limits radionuclide concentrations for 1,000 years after disposal in water withdrawn from most Class I ground waters to the concentrations allowed by the Agency's interim drinking water standards (unless concentrations in the Class I ground waters already exceed the limits in 40 CFR Part 141, in which case this set of requirements would limit the increases in the radionuclide concentrations to those specified in 40 CFR Part 141). Subpart B also contains informational guidance for implementation of the disposal standards to clarify the Agency's intended application of these standards, which address a time frame without precedent in environmental regulations. Although disposal of these materials in mined geologic repositories has received the most attention, the disposal standards apply to disposal by any method, except disposal directly into the oceans or ocean sediments.

This notice describes the final rule that the Agency developed after considering the public comments received on the proposed rule published on December 29, 1982, and the recommendations of a technical review conducted by the Agency's Science Advisory Board (SAB). The major comments received on the proposed standards are summarized together with the Agency's responses to them. Detailed responses to all the comments received are discussed in the Response to Comments Document prepared for this final rule.

DATE: These standards shall be promulgated for purposes of judicial review at 1:00 p.m. eastern time on October 3, 1985. These standards shall become effective on November 18, 1985.

ADDRESSES: *Background Information*—The technical information considered in developing this rule, including risk assessments of disposal of these wastes in mined geologic repositories, is summarized in the Background Information Document (BID) for 40 CFR Part 191, EPA 520/1-85-023. Single copies of both the BID and the Response to Comments Document, as available, may be obtained from the Program Management Office (ANR-458), Office of Radiation Programs, Environmental Protection Agency, Washington, DC 20460; telephone number (703) 557-9351.

Docket—Docket Number R-82-3 contains the rulemaking record for 40 CFR Part 191. The docket is available for inspection between 8 a.m. and 4 p.m. on weekdays in the West Tower Lobby, Gallery 1, Central Docket Section, 401 M Street, SW., Washington, DC. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Dan Egan or Ray Clark, Criteria and Standards Division (ANR-460), Office of Radiation Programs, Environmental Protection Agency, Washington, DC 20460; telephone number (703) 557-8610.

SUPPLEMENTARY INFORMATION:

Fissioning of nuclear fuel in nuclear reactors creates a small quantity of highly radioactive materials. Virtually all of these materials are retained in the "spent" fuel elements when they are removed from the reactor. If the fuel is then reprocessed to recover unfissioned uranium and plutonium, most of the radioactivity goes into acidic liquid wastes that will later be converted into various types of solid materials. These highly radioactive liquid or solid wastes from reprocessing spent nuclear fuel have traditionally been called "high-level wastes." If it is not to be reprocessed, the spent fuel itself becomes a waste. The nuclear reactors operated by the nation's electrical utilities currently generate about 2,000 metric tons of spent fuel per year. The relatively small physical quantity of these wastes is apparent when compared to the chemically hazardous wastes regulated under the Resource Conservation and Recovery Act, which are produced at a rate of about 150,000,000 metric tons per year.

Although they are produced in small quantities, proper management and disposal of high-level wastes and spent nuclear fuel are essential because of the inherent hazard of the large amounts of radioactivity they contain. Spent fuel from commercial nuclear power reactors contains about 1.6 billion curies of radionuclides with half-lives greater than 20 years. Over the next decade, this inventory is projected to grow at a rate of about 300 million curies per year from reactors currently licensed to operate. Most of this spent fuel is currently stored at reactor sites. Reprocessing reactor fuel used for national defense activities has produced about 700 million curies of radionuclides with half-lives greater than 20 years. Most of these wastes are stored in various liquid and solid forms on three Federal reservations in Idaho, Washington, and South Carolina.

In addition, a wide variety of wastes contaminated with man-made radionuclides heavier than uranium have been created by various processes, mostly from the atomic energy defense activities conducted by the DOE and its predecessor agencies (the Atomic Energy Commission and the Energy

media. The costs of the various engineering controls that might be needed to meet different levels of protection were estimated. In addition, allowances were made for the increased research and development costs that might be needed to demonstrate compliance with the standards if projected performance for a particular disposal system indicated releases less than an order of magnitude below the long-term radionuclide release limits in § 191.13.

Since the regulatory impact analyses that supported the proposed rule were performed, the NRC has promulgated minimum requirements for the engineered barriers of a disposal system (in 10 CFR Part 60), more data concerning disposal sites being considered by the Department have become available, and the Agency has reviewed its performance assessments to reduce overestimates of long-term risks in accordance with the SAB review. After evaluating all of this new information, the Agency believes that there need not be any significant additional costs to the national program for disposal of commercial wastes caused by retaining the proposed level of protection in the final rule, compared to the costs of choosing levels considerably less stringent. In other words, all of the disposal sites being evaluated by the Department, assuming compliance with the existing requirements of 10 CFR Part 60, are expected to be able to meet these disposal standards without additional precautions beyond those already planned.

List of Subjects in 40 CFR Part 191

Environmental protection, Nuclear energy, Radiation protection, Uranium, Waste treatment and disposal.

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Administrator hereby certifies that this rule will not have any significant impact on small businesses or other entitites, and that a Regulatory Flexibility Analysis is not required. This rule will affect only a small number of facilities, most of which are or will be operated by the United States Government.

Dated: August 15, 1985.

Lee M. Thomas,

Administrator.

A new Part 191 is hereby added to Title 40, Code of Federal Regulations, as follows:

SUBCHAPTER F—RADIATION PROTECTION PROGRAMS

PART 191—ENVIRONMENTAL RADIATION PROTECTION STANDARDS FOR MANAGEMENT AND DISPOSAL OF SPENT NUCLEAR FUEL, HIGH-LEVEL AND TRANSURANIC RADIOACTIVE WASTES

Subpart A—Environmental Standards for Management and Storage

Sec.
191.01 Applicability.
191.02 Definitions.
191.03 Standards.
191.04 Alternative standards.
191.05 Effective date.

Subpart B—Environmental Standards for Disposal

191.11 Applicability.
191.12 Definitions.
191.13 Containment requirements.
191.14 Assurance requirements.
191.15 Individual protection requirements.
191.16 Ground water protection requirements.
191.17 Alternative provisions for disposal.
191.18 Effective date.

Appendix A Table for Subpart B
Appendix B Guidance for Implementation of Subpart B

Authority: The Atomic Energy Act of 1954, as amended; Reorganization Plan No. 3 of 1970; and the Nuclear Waste Policy Act of 1982.

Subpart A—Environmental Standards for Management and Storage

§ 191.01 Applicability.

This Subpart applies to:

(a) Radiation doses received by members of the public as a result of the management (except for transportation) and storage of spent nuclear fuel or high-level or transuranic radioactive wastes at any facility regulated by the Nuclear Regulatory Commission or by Agreement States, to the extent that such management and storage operations are not subject to the provisions of Part 190 of title 40; and

(b) Radiation doses received by members of the public as a result of the management and storage of spent nuclear fuel or high-level or transuranic wastes at any disposal facility that is operated by the Department of Energy and that is not regulated by the Commission or by Agreement States.

§ 191.02 Definitions.

Unless otherwise indicated in this Subpart, all terms shall have the same meaning as in Subpart A of Part 190.

(a) "Agency" means the Environmental Protection Agency.

(b) "Administrator" means the Administrator of the Environmental Protection Agency.

(c) "Commission" means the Nuclear Regulatory Commission.

(d) "Department" means the Department of Energy.

(e) "NWPA" means the Nuclear Waste Policy Act of 1982 (Pub. L. 97-425).

(f) "Agreement State" means any State with which the Commission or the Atomic Energy Commission has entered into an effective agreement under subsection 274b of the Atomic Energy Act of 1954, as amended (68 Stat. 919).

(g) "Spent nuclear fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

(h) "High-level radioactive waste," as used in this Part, means high-level radioactive waste as defined in the Nuclear Waste Policy Act of 1982 (Pub. L. 97-425).

(i) "Transuranic radioactive waste," as used in this Part, means waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes, with half-lives greater than twenty years, per gram of waste, except for: (1) High-level radioactive wastes; (2) wastes that the Department has determined, with the concurrence of the Administrator, do not need the degree of isolation required by this Part; or (3) wastes that the Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

(j) "Radioactive waste," as used in this Part, means the high-level and transuranic radioactive waste covered by this Part.

(k) "Storage" means retention of spent nuclear fuel or radioactive wastes with the intent and capability to readily retrieve such fuel or waste for subsequent use, processing, or disposal.

(l) "Disposal" means permanent isolation of spent nuclear fuel or radioactive waste from the accessible environment with no intent of recovery, whether or not such isolation permits the recovery of such fuel or waste. For example, disposal of waste in a mined geologic repository occurs when all of the shafts to the repository are backfilled and sealed.

(m) "Management" means any activity, operation, or process (except for transportation) conducted to prepare spent nuclear fuel or radioactive waste for storage or disposal, or the activities associated with placing such fuel or waste in a disposal system.

(n) "Site" means an area contained within the boundary of a location under the effective control of persons possessing or using spent nuclear fuel or radioactive waste that are involved in

any activity, operation, or process covered by this Subpart.

(o) "General environment" means the total terrestrial, atmospheric, and aquatic environments outside sites within which any activity, operation, or process associated with the management and storage of spent nuclear fuel or radioactive waste is conducted.

(p) "Member of the public" means any individual except during the time when that individual is a worker engaged in any activity, operation, or process that is covered by the Atomic Energy Act of 1954, as amended.

(q) "Critical organ" means the most exposed human organ or tissue exclusive of the integumentary system (skin) and the cornea.

§ 191.03 Standards.

(a) Management and storage of spent nuclear fuel or high-level or transuranic radioactive wastes at all facilities regulated by the Commission or by Agreement States shall be conducted in such a manner as to provide reasonable assurance that the combined annual dose equivalent to any member of the public in the general environment resulting from: (1) Discharges of radioactive material and direct radiation from such management and storage and (2) all operations covered by Part 190; shall not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other critical organ.

(b) Management and storage of spent nuclear fuel or high-level or transuranic radioactive wastes at all facilities for the disposal of such fuel or waste that are operated by the Department and that are not regulated by the Commission or Agreement States shall be conducted in such a manner as to provide reasonable assurance that the combined annual dose equivalent to any member of the public in the general environment resulting from discharges of radioactive material and direct radiation from such management and storage shall not exceed 25 millirems to the whole body and 75 millirems to any critical organ.

§ 191.04 Alternative standards.

(a) The Administrator may issue alternative standards from those standards established in 191.03(b) for waste management and storage activities at facilities that are not regulated by the Commission or Agreement States if, upon review of an application for such alternative standards:

(1) The Administrator determines that such alternative standards will prevent any member of the public from receiving a continuous exposure of more than 100 millirems per year dose equivalent and an infrequent exposure of more than 500 millirems dose equivalent in a year from all sources, excluding natural background and medical procedures; and

(2) The Administrator promptly makes a matter of public record the degree to which continued operation of the facility is expected to result in levels in excess of the standards specified in 191.03(b).

(b) An application for alternative standards shall be submitted as soon as possible after the Department determines that continued operation of a facility will exceed the levels specified in 191.03(b) and shall include all information necessary for the Administrator to make the determinations called for in 191.04(a).

(c) Requests for alternative standards shall be submitted to the Administrator, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460.

§ 191.05 Effective date.

The standards in this Subpart shall be effective on November 18, 1985.

Subpart B—Environmental Standards for Disposal

§ 191.11 Applicability.

(a) This Subpart applies to:

(1) Radioactive materials released into the accessible environment as a result of the disposal of spent nuclear fuel or high-level or transuranic radioactive wastes;

(2) Radiation doses received by members of the public as a result of such disposal; and

(3) Radioactive contamination of certain sources of ground water in the vicinity of disposal systems for such fuel or wastes.

(b) However, this Subpart does not apply to disposal directly into the oceans or ocean sediments. This Subpart also does not apply to wastes disposed of before the effective date of this rule.

§ 191.12 Definitions.

Unless otherwise indicated in this Subpart, all terms shall have the same meaning as in Subpart A of this Part.

(a) "Disposal system" means any combination of engineered and natural barriers that isolate spent nuclear fuel or radioactive waste after disposal.

(b) "Waste," as used in this Subpart, means any spent nuclear fuel or radioactive waste isolated in a disposal system.

(c) "Waste form" means the materials comprising the radioactive components of waste and any encapsulating or stabilizing matrix.

(d) "Barrier" means any material or structure that prevents or substantially delays movement of water or radionuclides toward the accessible environment. For example, a barrier may be a geologic structure, a canister, a waste form with physical and chemical characteristics that significantly decrease the mobility of radionuclides, or a material placed over and around waste, provided that the material or structure substantially delays movement of water or radionuclides.

(e) "Passive institutional control" means: (1) Permanent markers placed at a disposal site, (2) public records and archives, (3) government ownership and regulations regarding land or resource use, and (4) other methods of preserving knowledge about the location, design, and contents of a disposal system.

(f) "Active institutional control" means: (1) Controlling access to a disposal site by any means other than passive institutional controls; (2) performing maintenance operations or remedial actions at a site, (3) controlling or cleaning up releases from a site, or (4) monitoring parameters related to disposal system performance.

(g) "Controlled area" means: (1) A surface location, to be identified by passive institutional controls, that encompasses no more than 100 square kilometers and extends horizontally no more than five kilometers in any direction from the outer boundary of the original location of the radioactive wastes in a disposal system; and (2) the subsurface underlying such a surface location.

(h) "Ground water" means water below the land surface in a zone of saturation.

(i) "Aquifer" means an underground geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.

(j) "Lithosphere" means the solid part of the Earth below the surface, including any ground water contained within it.

(k) "Accessible environment" means: (1) The atmosphere; (2) land surfaces; (3) surface waters; (4) oceans; and (5) all of the lithosphere that is beyond the controlled area.

(l) "Transmissivity" means the hydraulic conductivity integrated over the saturated thickness of an underground formation. The transmissivity of a series of formations is the sum of the individual

transmissivities of each formation comprising the series.

(m) "Community water system" means a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

(n) "Significant source of ground water," as used in this Part, means: (1) An aquifer that: (i) Is saturated with water having less than 10,000 milligrams per liter of total dissolved solids; (ii) is within 2,500 feet of the land surface; (iii) has a transmissivity greater than 200 gallons per day per foot, provided that any formation or part of a formation included within the source of ground water has a hydraulic conductivity greater than 2 gallons per day per square foot; and (iv) is capable of continuously yielding at least 10,000 gallons per day to a pumped or flowing well for a period of at least a year; or (2) an aquifer that provides the primary source of water for a community water system as of the effective date of this Subpart.

(o) "Special source of ground water," as used in this Part, means those Class I ground waters identified in accordance with the Agency's Ground-Water Protection Strategy published in August 1984 that: (1) Are within the controlled area encompassing a disposal system or are less than five kilometers beyond the controlled area; (2) are supplying drinking water for thousands of persons as of the date that the Department chooses a location within that area for detailed characterization as a potential site for a disposal system (e.g., in accordance with Section 112(b)(1)(B) of the NWPA); and (3) are irreplaceable in that no reasonable alternative source of drinking water is available to that population.

(p) "Undisturbed performance" means the predicted behavior of a disposal system, including consideration of the uncertainties in predicted behavior, if the disposal system is not disrupted by human intrusion or the occurrence of unlikely natural events.

(q) "Performance assessment" means an analysis that: (1) Identifies the processes and events that might affect the disposal system; (2) examines the effects of these processes and events on the performance of the disposal system; and (3) estimates the cumulative releases of radionuclides, considering the associated uncertainties, caused by all significant processes and events. These estimates shall be incorporated into an overall probability distribution of cumulative release to the extent practicable.

(r) "Heavy metal" means all uranium, plutonium, or thorium placed into a nuclear reactor.

(s) "Implementing agency," as used in this Subpart, means the Commission for spent nuclear fuel or high-level or transuranic wastes to be disposed of in facilities licensed by the Commission in accordance with the Energy Reorganization Act of 1974 and the Nuclear Waste Policy Act of 1982, and it means the Department for all other radioactive wastes covered by this Part.

§ 191.13 Containment requirements.

(a) Disposal systems for spent nuclear fuel or high-level or transuranic radioactive wastes shall be designed to provide a reasonable expectation, based upon performance assessments, that the cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal from all significant processes and events that may affect the disposal system shall:

(1) Have a likelihood of less than one chance in 10 of exceeding the quantities calculated according to Table 1 (Appendix A); and

(2) Have a likelihood of less than one chance in 1,000 of exceeding ten times the quantities calculated according to Table 1 (Appendix A).

(b) Performance assessments need not provide complete assurance that the requirements of 191.13(a) will be met. Because of the long time period involved and the nature of the events and processes of interest, there will inevitably be substantial uncertainties in projecting disposal system performance. Proof of the future performance of a disposal system is not to be had in the ordinary sense of the word in situations that deal with much shorter time frames. Instead, what is required is a reasonable expectation, on the basis of the record before the implementing agency, that compliance with 191.13 (a) will be achieved.

§ 191.14 Assurance requirements.

To provide the confidence needed for long-term compliance with the requirements of 191.13, disposal of spent nuclear fuel or high-level or transuranic wastes shall be conducted in accordance with the following provisions, except that these provisions do not apply to facilities regulated by the Commission (see 10 CFR Part 60 for comparable provisions applicable to facilities regulated by the Commission):

(a) Active institutional controls over disposal sites should be maintained for as long a period of time as is practicable after disposal; however, performance assessments that assess isolation of the wastes from the accessible environment shall not consider any contributions from active institutional controls for more than 100 years after disposal.

(b) Disposal systems shall be monitored after disposal to detect substantial and detrimental deviations from expected performance. This monitoring shall be done with techniques that do not jeopardize the isolation of the wastes and shall be conducted until there are no significant concerns to be addressed by further monitoring.

(c) Disposal sites shall be designated by the most permanent markers, records, and other passive institutional controls practicable to indicate the dangers of the wastes and their location.

(d) Disposal systems shall use different types of barriers to isolate the wastes from the accessible environment. Both engineered and natural barriers shall be included.

(e) Places where there has been mining for resources, or where there is a reasonable expectation of exploration for scarce or easily accessible resources, or where there is a significant concentration of any material that is not widely available from other sources, should be avoided in selecting disposal sites. Resources to be considered shall include minerals, petroleum or natural gas, valuable geologic formations, and ground waters that are either irreplaceable because there is no reasonable alternative source of drinking water available for substantial populations or that are vital to the preservation of unique and sensitive ecosystems. Such places shall not be used for disposal of the wastes covered by this Part unless the favorable characteristics of such places compensate for their greater likelihood of being disturbed in the future.

(f) Disposal systems shall be selected so that removal of most of the wastes is not precluded for a reasonable period of time after disposal.

§ 191.15 Individual protection requirements.

Disposal systems for spent nuclear fuel or high-level or transuranic radioactive wastes shall be designed to provide a reasonable expectation that, for 1,000 years after disposal, undisturbed performance of the disposal system shall not cause the annual dose equivalent from the disposal system to any member of the public in the accessible environment to exceed 25 millirems to the whole body or 75 millirems to any critical organ. All potential pathways (associated with undisturbed performance) from the disposal system to people shall be

considered, including the assumption that individuals consume 2 liters per day of drinking water from any significant source of ground water outside of the controlled area.

§ 191.16 Ground water protection requirements.

(a) Disposal systems for spent nuclear fuel or high-level or transuranic radioactive wastes shall be designed to provide a reasonable expectation that, for 1,000 years after disposal, undisturbed performance of the disposal system shall not cause the radionuclide concentrations averaged over any year in water withdrawn from any portion of a special source of ground water to exceed:

(1) 5 picocuries per liter of radium-226 and radium-228;

(2) 15 picocuries per liter of alpha-emitting radionuclides (including radium-226 and radium-228 but excluding radon); or

(3) The combined concentrations of radionuclides that emit either beta or gamma radiation that would produce an annual dose equivalent to the total body or any internal organ greater than 4 millirems per year if an individual consumed 2 liters per day of drinking water from such a source of ground water.

(b) If any of the average annual radionuclide concentrations existing in a special source of ground water before construction of the disposal system already exceed the limits in 191.16(a), the disposal system shall be designed to provide a reasonable expectation that, for 1,000 years after disposal, undisturbed performance of the disposal system shall not increase the existing average annual radionuclide concentrations in water withdrawn from that special source of ground water by more than the limits established in 191.16(a).

§ 191.17 Alternative provisions for disposal.

The Administrator may, by rule, substitute for any of the provisions of Subpart B alternative provisions chosen after:

(a) The alternative provisions have been proposed for public comment in the Federal Register together with information describing the costs, risks, and benefits of disposal in accordance with the alternative provisions and the reasons why compliance with the existing provisions of Subpart B appears inappropriate;

(b) A public comment period of at least 90 days has been completed, during which an opportunity for public hearings in affected areas of the country has been provided; and

(c) The public comments received have been fully considered in developing the final version of such alternative provisions.

§ 191.18 Effective date.

The standards in this Subpart shall be effective on ~~September 19~~, November 18, 1985.

Appendix A—Table for Subpart B

TABLE 1.—RELEASE LIMITS FOR CONTAINMENT REQUIREMENTS

[Cumulative releases to the accessible environment for 10,000 years after disposal]

Radionuclide	Release limit per 1,000 MTHM or other unit of waste (see notes) (curies)
Americium-241 or -243	100
Carbon-14	100
Cesium-135 or -137	1,000
Iodine-129	100
Neptunium-237	100
Plutonium-238, -239, -240, or -242	100
Radium-226	100
Strontium-90	1,000
Technetium-99	10,000
Thorium-230 or -232	10
Tin-126	1,000
Uranium-233, -234, -235, -236, or -238	100
Any other alpha-emitting radionuclide with a half-life greater than 20 years	100
Any other radionuclide with a half-life greater than 20 years that does not emit alpha particles	1,000

Application of Table 1

Note 1: *Units of Waste.* The Release Limits in Table 1 apply to the amount of wastes in any one of the following:

(a) An amount of spent nuclear fuel containing 1,000 metric tons of heavy metal (MTHM) exposed to a burnup between 25,000 megawatt-days per metric ton of heavy metal (MWd/MTHM) and 40,000 MWd/MTHM;

(b) The high-level radioactive wastes generated from reprocessing each 1,000 MTHM exposed to a burnup between 25,000 MWd/MTHM and 40,000 MWd/MTHM;

(c) Each 100,000,000 curies of gamma or beta-emitting radionuclides with half-lives greater than 20 years but less than 100 years (for use as discussed in Note 5 or with materials that are identified by the Commission as high-level radioactive waste in accordance with part B of the definition of high-level waste in the NWPA);

(d) Each 1,000,000 curies of other radionuclides (i.e., gamma or beta-emitters with half-lives greater than 100 years or any alpha-emitters with half-lives greater than 20 years) (for use as discussed in Note 5 or with materials that are identified by the Commission as high-level radioactive waste in accordance with part B of the definition of high-level waste in the NWPA); or

(e) An amount of transuranic (TRU) wastes containing one million curies of alpha-emitting transuranic radionuclides with half-lives greater than 20 years.

Note 2: *Release Limits for Specific Disposal Systems.* To develop Release Limits for a particular disposal system, the quantities in Table 1 shall be adjusted for the amount of waste included in the disposal system compared to the various units of waste defined in Note 1. For example:

(a) If a particular disposal system contained the high-level wastes from 50,000 MTHM, the Release Limits for that system would be the quantities in Table 1 multiplied by 50 (50,000 MTHM divided by 1,000 MTHM).

(b) If a particular disposal system contained three million curies of alpha-emitting transuranic wastes, the Release Limits for that system would be the quantities in Table 1 multiplied by three (three million curies divided by one million curies).

(c) If a particular disposal system contained both the high-level wastes from 50,000 MTHM *and* 5 million curies of alpha-emitting transuranic wastes, the Release Limits for that system would be the quantities in Table 1 multiplied by 55:

$$\frac{50{,}000 \text{ MTHM}}{1{,}000 \text{ MTHM}} + \frac{5{,}000{,}000 \text{ curies TRU}}{1{,}000{,}000 \text{ curies TRU}} = 55$$

Note 3: *Adjustments for Reactor Fuels with Different Burnup.* For disposal systems containing reactor fuels (or the high-level wastes from reactor fuels) exposed to an average burnup of less than 25,000 MWd/MTHM or greater than 40,000 MWd/MTHM, the units of waste defined in (a) and (b) of Note 1 shall be adjusted. The unit shall be multiplied by the ratio of 30,000 MWd/MTHM divided by the fuel's actual average burnup, except that a value of 5,000 MWd/MTHM may be used when the average fuel burnup is below 5,000 MWd/MTHM and a value of 100,000 MWd/MTHM shall be used when the average fuel burnup is above 100,000 MWd/MTHM. This adjusted unit of waste shall then be used in determining the Release Limits for the disposal system.

For example, if a particular disposal system contained only high-level wastes with an average burnup of 3,000 MWd/MTHM, the unit of waste for that disposal system would be:

$$1{,}000 \text{ MTHM} \times \frac{(30{,}000)}{(5{,}000)} = 6{,}000 \text{ MTHM}$$

If that disposal system contained the high-level wastes from 60,000 MTHM (with an average burnup of 3,000 MWd/MTHM), then

the Release Limits for that system would be the quantities in Table 1 multiplied by ten:

$$\frac{60{,}000 \text{ MTHM}}{6{,}000 \text{ MTHM}} = 10$$

which is the same as:

$$\frac{60{,}000 \text{ MTHM}}{1{,}000 \text{ MTHM}} \times \frac{(5{,}000 \text{ MWd/MTHM})}{(30{,}000 \text{ MWd/MTHM})} = 10$$

Note 4: *Treatment of Fractionated High-Level Wastes.* In some cases, a high-level waste stream from reprocessing spent nuclear fuel may have been (or will be) separated into two or more high-level waste components destined for different disposal systems. In such cases, the implementing agency may allocate the Release Limit multiplier (based upon the original MTHM and the average fuel burnup of the high-level waste stream) among the various disposal systems as it chooses, provided that the total Release Limit multiplier used for that waste stream at all of its disposal systems may not exceed the Release Limit multiplier that would be used if the entire waste stream were disposed of in one disposal system.

Note 5: *Treatment of Wastes with Poorly Known Burnups or Original MTHM.* In some cases, the records associated with particular high-level waste streams may not be adequate to accurately determine the original metric tons of heavy metal in the reactor fuel that created the waste, or to determine the average burnup that the fuel was exposed to. If the uncertainties are such that the original amount of heavy metal or the average fuel burnup for particular high-level waste streams cannot be quantified, the units of waste derived from (a) and (b) of Note 1 shall no longer be used. Instead, the units of waste defined in (c) and (d) of Note 1 shall be used for such high-level waste streams. If the uncertainties in such information allow a range of values to be associated with the original amount of heavy metal or the average fuel burnup, then the calculations described in previous Notes will be conducted using the values that result in the smallest Release Limits, except that the Release Limits need not be smaller than those that would be calculated using the units of waste defined in (c) and (d) of Note 1.

Note 6: *Uses of Release Limits to Determine Compliance with 191.13* Once release limits for a particular disposal system have been determined in accordance with Notes 1 through 5, these release limits shall be used to determine compliance with the requirements of 191.13 as follows. In cases where a mixture of radionuclides is projected to be released to the accessible environment, the limiting values shall be determined as follows: For each radionuclide in the mixture, determine the ratio between the cumulative release quantity projected over 10,000 years and the limit for that radionuclide as determined from Table 1 and Notes 1 through 5. The sum of such ratios for all the radionuclides in the mixture may not exceed one with regard to 191.13(a)(1) and may not exceed ten with regard to 191.13(a)(2).

For example, if radionuclides A, B, and C are projected to be released in amounts Q_a, Q_b, and Q_c, and if the applicable Release Limits are RL_a, RL_b, and RL_c, then the cumulative releases over 10,000 years shall be limited so that the following relationship exists:

$$\frac{Q_a}{RL_a} + \frac{Q_b}{RL_b} + \frac{Q_c}{RL_c} \leq 1$$

Appendix B—Guidance for Implementation of Subpart B

[**Note:** The supplemental information in this appendix is not an integral part of 40 CFR Part 191. Therefore, the implementing agencies are not bound to follow this guidance. However, it is included because it describes the Agency's assumptions regarding the implementation of Subpart B. This appendix will appear in the Code of Federal Regulations.]

The Agency believes that the implementing agencies must determine compliance with §§ 191.13, 191.15, and 191.16 of Subpart B by evaluating long-term predictions of disposal system performance. Determining compliance with § 191.13 will also involve predicting the likelihood of events and processes that may disturb the disposal system. In making these various predictions, it will be appropriate for the implementing agencies to make use of rather complex computational models, analytical theories, and prevalent expert judgment relevant to the numerical predictions. Substantial uncertainties are likely to be encountered in making these predictions. In fact, sole reliance on these numerical predictions to determine compliance may not be appropriate; the implementing agencies may choose to supplement such predictions with qualitative judgments as well. Because the procedures for determining compliance with Subpart B have not been formulated and tested yet, this appendix to the rule indicates the Agency's assumptions regarding certain issues that may arise when implementing §§ 191.13, 191.15, and 191.16. Most of this guidance applies to any type of disposal system for the wastes covered by this rule. However, several sections apply only to disposal in mined geologic repositories and would be inappropriate for other types of disposal systems.

Consideration of Total Disposal System. When predicting disposal system performance, the Agency assumes that reasonable projections of the protection expected from all of the engineered and natural barriers of a disposal system will be considered. Portions of the disposal system should not be disregarded, even if projected performance is uncertain, except for portions of the system that make negligible contributions to the overall isolation provided by the disposal system.

Scope of Performance Assessments. Section 191.13 requires the implementing agencies to evaluate compliance through performance assessments as defined in § 191.12(q). The Agency assumes that such performance assessments need not consider categories of events or processes that are estimated to have less than one chance in 10,000 of occurring over 10,000 years. Furthermore, the performance assessments need not evaluate in detail the releases from all events and processes estimated to have a greater likelihood of occurrence. Some of these events and processes may be omitted from the performance assessments if there is a reasonable expectation that the remaining probability distribution of cumulative releases would not be significantly changed by such omissions.

Compliance with Section 191.13. The Agency assumes that, whenever practicable, the implementing agency will assemble all of the results of the performance assessments to determine compliance with § 191.13 into a "complementary cumulative distribution function" that indicates the probability of exceeding various levels of cumulative release. When the uncertainties in parameters are considered in a performance assessment, the effects of the uncertainties considered can be incorporated into a single such distribution function for each disposal system considered. The Agency assumes that a disposal system can be considered to be in compliance with § 191.13 if this single distribution function meets the requirements of § 191.13(a).

Compliance with Sections 191.15 and 191.16. When the uncertainties in undisturbed performance of a disposal system are considered, the implementing agencies need not require that a very large percentage of the range of estimated radiation exposures or radionuclide concentrations fall below limits established in §§ 191.15 and 191.16, respectively. The Agency assumes that compliance can be determined based upon "best estimate" predictions (e.g., the mean or the median of the appropriate distribution, whichever is higher).

Institutional Controls. To comply with § 191.14(a), the implementing agency will assume that none of the active institutional controls prevent or reduce radionuclide releases for more than 100 years after disposal. However, the Federal Government is committed to retaining ownership of all disposal sites for spent nuclear fuel and high-level and transuranic radioactive wastes and will establish appropriate markers and records, consistent with § 191.14(c). The Agency assumes that, as long as such passive institutional controls endure and are understood, they: (1) can be effective in deterring systematic or persistent exploitation of these disposal sites; and (2) can reduce the likelihood of inadvertent, intermittent human intrusion to a degree to be determined by the implementing agency. However, the Agency believes that passive institutional controls can never be assumed to eliminate the chance of inadvertent and intermittent human intrusion into these disposal sites.

Consideration of Inadvertent Human Intrusion into Geologic Repositories. The most speculative potential disruptions of a mined geologic repository are those associated with inadvertent human intrusion. Some types of intrusion would have virtually no effect on a repository's containment of

waste. On the other hand, it is possible to conceive of intrusions (involving widespread societal loss of knowledge regarding radioactive wastes) that could result in major disruptions that no reasonable repository selection or design precautions could alleviate. The Agency believes that the most productive consideration of inadvertent intrusion concerns those realistic possibilities that may be usefully mitigated by repository design, site selection, or use of passive controls (although passive institutional controls should not be assumed to completely rule out the possibility of intrusion). Therefore, inadvertent and intermittent intrusion by exploratory drilling for resources (other than any provided by the disposal system itself) can be the most severe intrusion scenario assumed by the implementing agencies. Furthermore, the implementing agencies can assume that passive institutional controls or the intruders' own exploratory procedures are adequate for the intruders to soon detect, or be warned of, the incompatibility of the area with their activities.

Frequency and Severity of Inadvertent Human Intrusion into Geologic Repositories. The implementing agencies should consider the effects of each particular disposal system's site, design, and passive institutional controls in judging the likelihood and consequences of such inadvertent exploratory drilling. However, the Agency assumes that the likelihood of such inadvertent and intermittent drilling need not be taken to be greater than 30 boreholes per square kilometer of repository area per 10,000 years for geologic repositories in proximity to sedimentary rock formations, or more than 3 boreholes per square kilometer per 10,000 years for repositories in other geologic formations. Furthermore, the Agency assumes that the consequences of such inadvertent drilling need not be assumed to be more severe than: (1) Direct release to the land surface of all the ground water in the repository horizon that would promptly flow through the newly created borehole to the surface due to natural lithostatic pressure—or (if pumping would be required to raise water to the surface) release of 200 cubic meters of ground water pumped to the surface if that much water is readily available to be pumped; and (2) creation of a ground water flow path with a permeability typical of a borehole filled by the soil or gravel that would normally settle into an open hole over time—not the permeability of a carefully sealed borehole.

[FR Doc. 85-20331 Filed 9-18-85; 8:45 am]
BILLING CODE 6560-50-M

(2) *Further information required.* The notice sent to the partners shall also—

(i) Explain the right of any partner or any group of partners holding a 5-percent or greater interest in the income of the partnership to negate the authority of the partnership to act on behalf of all partners by filing a notice in accordance with § 51.6232(c)–3; and

(ii) Explain the right of each partner individually to elect not to have the partnership act on behalf of that partner by filing a notice in accordance with § 51.6232 (c)–4.

§ 51.6232(c)–3 "5 percent" election for removal years after 1984.

(a) *In general.* Any partner or group of partners owning in the aggregate at least 5 percent of the income interest of the partnership may elect to negate the authority of the partnership to act on behalf of the partners for a removal year after 1984 by filing a written notice to that effect. For rules with respect to removal years 1983 and 1984, see § 150.6232(c)–3

(b) *Procedure for making election—(1) Time and place for filing.* The notice described in paragraph (a) of this section shall be filed with the Austin Service Center (at the address specified in § 51.6232 (c)–1 (e)) on or before December 31 of the removal year to which the election applies.

(2) *Content of notice.* The notice shall—

(i) Identify the partnership by name, address, and identification number;

(ii) Identify the partners forming the 5-percent group by name, address, identification number, and percentage interest in the partnership;

(iii) Be signed by all members of the group making the election; and

(iv) Be clearly identified as an election to negate the authority of the partnership to act for all partners.

Any notice not clearly identified as a notice of election under this section shall be treated as an individual election under § 51.6232 (c)–4. Thus, for example, a notice by a single partner owning a 5-percent interest that is not clearly identified as an election to negate the authority of the partnership to act for all partners shall be treated as an individual election under § 51.6232(c)–4.

(c) *Copy for partnership.* A copy of the notice shall be furnished to the partnership within the period prescribed for filing the notice.

§ 51.6232 (c)–4 Individual election for removal years after 1984.

(a) *In general.* Any partner desiring that the partnership not be authorized to act on its behalf for a removal year after 1984 shall file a notice in accordance with the rules set forth in this section. For rules with respect to removal years 1983 and 1984, see § 150.6232 (c)–4.

(b) *Procedure for making election—(1) Time and place for filing.* The notice described in paragraph (a) of this section shall be filed with the Austin Service Center (at the address specified in § 150.6232 (c)–1(e)) on or before December 31 of the removal year to which the election applies.

(2) *Content of notice.* The notice shall clearly identify the partner and the partnership by name, address, and identification number and shall state that it constitutes an election to deny the partnership the right to represent the partner in proceedings related to windfall profit tax on partnership production during the removal year. The notice shall be signed by the partner.

(3) *Copy for partnership.* A copy of the notice shall be furnished to the partnership within the period prescribed for filing the notice.

§ 51.6232 (c)–5 Partner responsibility when partnership authority is negated for removal year after 1984.

(a) *In general.* If the partnership makes an election under § 51.6232 (c)–2 to act on behalf of the partners for a removal year after 1984, this section shall apply with respect to—

(1) All partners if an election under § 51.6232 (c)–3 is made, and

(2) Any partner who makes an election under § 51.6232 (c)–4.

For rules with respect to removal years 1983 and 1984, see § 150.6232 (c)–5.

(b) *Partner shall pay additional tax or claim credit or refund.* The partner shall aggregate the Form 6248 information received from the partnership with Form 6248 information received from other sources to determine whether a net overpayment or underpayment of windfall profit tax exists for the partner's interests in oil properties. If a net underpayment exists the partner shall file Form 720 with the service center designated on that form and pay any tax due by the time prescribed in § 51.6075–1. If a net overpayment exists, the partner may file a Form 843 or any other appropriate form to claim a credit or refund in accordance with the applicable instructions.

(c) *Partner is in same position as under rules for income tax proceedings.* The partner retains any right with respect to the determination of the tax treatment of partnership items for windfall profit tax purposes that the partner would possess under sections 6221 through 6231 and the regulations under those sections. For example, the partner is entitled to receive notice of the proceedings from the tax matters partner or the Service if that partner is entitled to receive notice under section 6223 of the Code, and the partner is entitled to participate in any administrative or judicial proceeding. Similarly, a settlement agreement entered into between the Service and the tax matters partner is binding on that partner if a settlement entered into under section 6224(c) of the Code would be binding on the partner.

PART 602—[AMENDED]

Par. 3. The authority citation for Part 602 continues to read:

Authority: 26 U.S.C. 7805.

Par. 4. Section 602.101 (c) is amended by inserting in the appropriate place in the table "51.6232 . . . 1545–0224."

Roscoe L. Egger, Jr.,
Commissioner of Internal Revenue.

Approved: September 17, 1985.

Ronald A. Pearlman,
Assistant Secretary of Treasury.

[FR Doc. 85–23458 Filed 9–27–85; 12:57 p.m.]

BILLING CODE 4830–01–M

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 191

[AH–FRL 2870–3]

Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes

Correction

In FR Doc. 85–20331, beginning on page 38066 in the issue of Thursday, September 19, 1985, make the following correction:

On page 38087, second column, § 191.18, second line, the date should read "November 18, 1985".

BILLING CODE 1505–01–M

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Office of the Secretary

42 CFR Part 420

Medicare and Medicaid Programs; Fraud and Abuse

AGENCY: Office of the Secretary, HHS.

ACTION: Correction notice to final rule.

SUMMARY: This document corrects 42 CFR 420.101 by restoring content to that regulation provision that was unintentionally omitted when the final rule was published.

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FINAL COMMUNITY RELATIONS PLAN

FOR

SHEBOYGAN RIVER AND HARBOR

SHEBOYGAN, WISCONSIN

SEPTEMBER 1986

Prepared For

U.S. Environmental Protection Agency
Office of Public Affairs
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Document No.: 174-CR1-OP-CHSS-1
W.A. No.: 265-5LX4

ATTACHMENT 5

PERFORMANCE OF REMEDIAL RESPONSE
ACTIVITIES AT UNCONTROLLED HAZARDOUS
WASTE SITES (REM II)

U.S. EPA CONTRACT NO. 68-01-6939

DRAFT COMMUNITY RELATIONS PLAN

FOR

SHEBOYGAN RIVER AND HARBOR

SHEBOYGAN, WISCONSIN

REM II DOCUMENT NO.: 174-CR1-OP-CHSS-1

Prepared by: Jacqueline Dingfelder Date: Sept 29, 1986
Jacqueline Dingfelder
REM II Community Relations
Specialist

Approved by: R. C. Oakes for Date: Sept 29, 1986
Marion Cox
REM II NPMO Community Relations
Coordinator

Approved by: for Jun Yoshitani Date: 10/1/86
Daniel Buss
REM II Site Manager

Approved by: Jun Yoshitani Date: 10/1/86
Jun Yoshitani, P.E.
REM II Region V Manager

5915

CDM

environmental engineers, scientists, planners, & management consultants

CAMP DRESSER & McKEE INC

11 East Adams Street, Suite 1100
Chicago, Illinois 60603
312 786-1313

October 1, 1986

Mr. Gregory A. Vanderlaan
Regional Project Officer
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

Ms. Judy Beck
Regional Superfund Community Relations
Coordinator
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

Subject: Final Community Relations Plan for Sheboygan River and Harbor Site

Work Assignment No.: 265-5LX4

EPA Contract No.: 68-01-6939

Document No.: 174-CR1-OP-CHSS-1

Dear Mr. Vanderlaan and Ms. Beck:

Camp Dresser & McKee Inc. is pleased to submit this final community relations plan for the Sheboygan River and Harbor site.

If you have any questions or comments, please contact me.

Very truly yours,

CAMP DRESSER & McKEE INC.

Jun Yoshitani, P.E.
Associate
Region V Manager

JY:sjr

000061

COMMUNITY RELATIONS PLAN
SHEBOYGAN RIVER AND HARBOR
SHEBOYGAN, WISCONSIN

This community relations plan identifies issues of community concern regarding the Sheboygan River and Harbor site, located in Sheboygan, Wisconsin, and describes the community relations program to be implemented during the remedial investigation and feasibility study (RI/FS) to meet those concerns. The site was proposed for the National Priority List (NPL) in September 1985, and placed on the final list in June 1986. In March 1986, the United States Environmental Protection Agency (U.S. EPA), Wisconsin Department of Natural Resources (WDNR), and a potentially responsible party (PRP) signed a consent order which requires the PRP to conduct the RI/FS at the site. The consent order and work plan were finalized following inclusion of public comments. The U.S. EPA Region V office, with input from WDNR, will supervise the technical and community relations activities at the site. U.S. EPA will conduct all community relations activities.

This community relations plan is divided into the following sections:

A. Site Description;
B. Community Background;
C. Highlights of the Community Relations Program;
D. Community Relations Activities and Timing; and
E. Schedule and Staffing Plan.

A contact list of key officials, media representatives, interest groups, and local citizens is included as Appendix A. Appendix B lists suggested locations for information repositories and public meetings. The community relations plan is based on interviews conducted in February 1986 with Sheboygan officials, residents, and interest group members.

A. Site Description

The Sheboygan River and Harbor site is located on the western shore of Lake Michigan in Sheboygan, Wisconsin. (See Exhibit 1 for a location map.) The site consists of the Sheboygan Harbor, which was built by the U.S. Army Corps of Engineers (COE) and occupies approximately ninety-six acres, and eight miles of the lower Sheboygan River. (See Exhibit 2 for a site map.) The harbor is formed by two breakwalls, located immediately south of the river mouth and about 2000 feet north of the river mouth. The COE is authorized to maintain a Federal navigable channel at Sheboygan. In order to keep the harbor navigable for commercial and recreational boats, the COE must dredge the channel on a regular basis.

Various local, State, Regional and Federal agencies have been involved with the Sheboygan Harbor portion of the site, which has a long and complicated history. In 1955, the COE began dredging the Sheboygan River and Harbor annually and depositing the dredged sediments in offshore water of Lake Michigan. In 1969, the COE sampled the harbor sediments and found them contaminated with pollutants and heavy metals. Section 123 of the U.S. 1970 Rivers and Harbor Act allows dredging of polluted sediments if they are deposited in a confined disposal facility (CDF) and below environmental impact assessment standards. In 1969, the COE discontinued the dredging. In the early 1970s, the COE began planning for the construction of a CDF in the Sheboygan Harbor. This facility would be used for disposal of dredged materials and allow dredging in the Federal channel to resume.

At about the same time, the City of Sheboygan began planning for development of a recreational marina within Sheboygan Harbor to enhance the economic development of the area. The city proposed that the CDF for the disposal of dredged sediments be built and serve as part of the marina development. In anticipation of building a CDF in Sheboygan Harbor, the COE in 1978 submitted to the U.S. EPA's Region V

Exhibit 1
Site Location
SHEBOYGAN RIVER AND HARBOR SITE
SHEBOYGAN, WISCONSIN

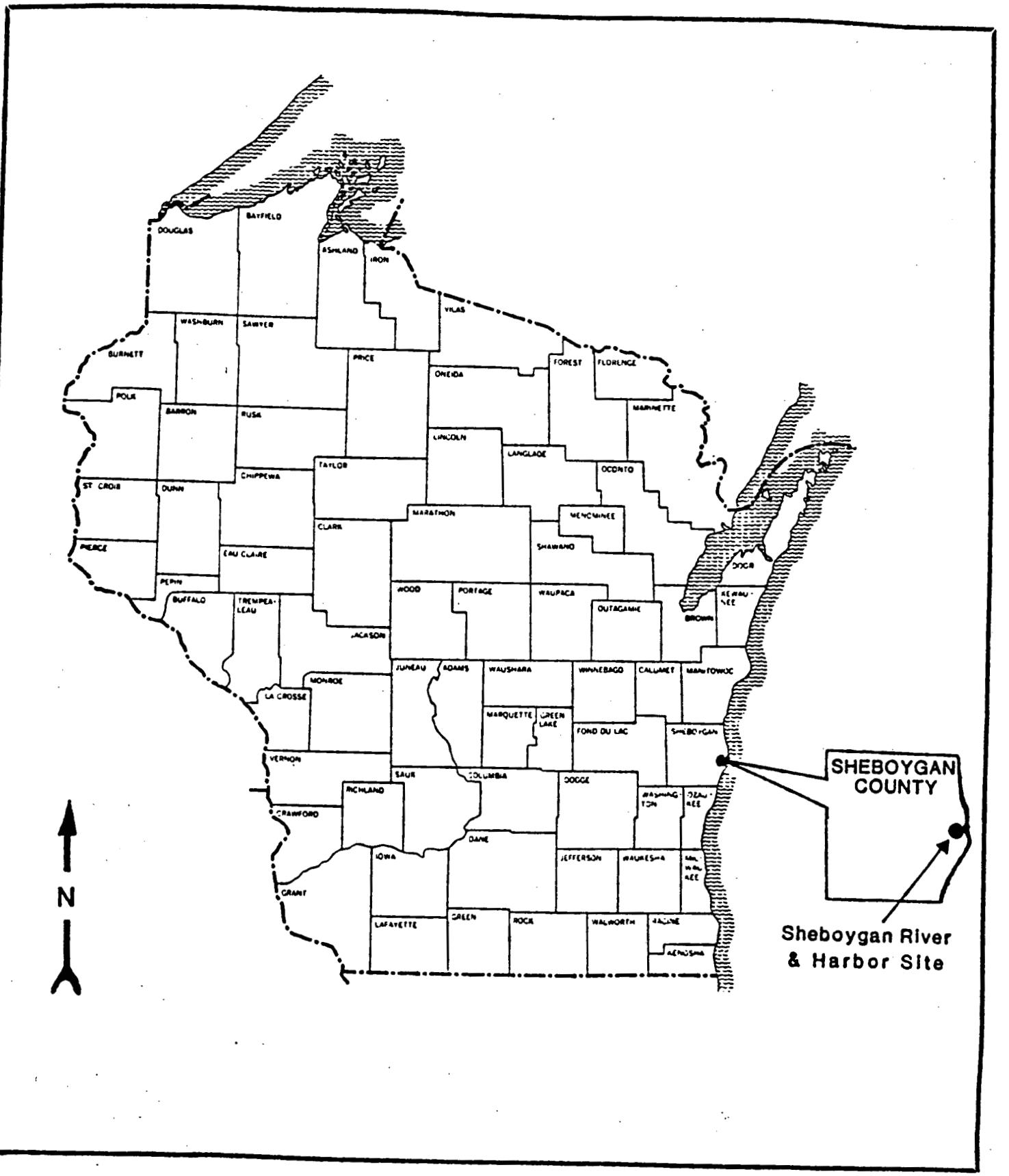
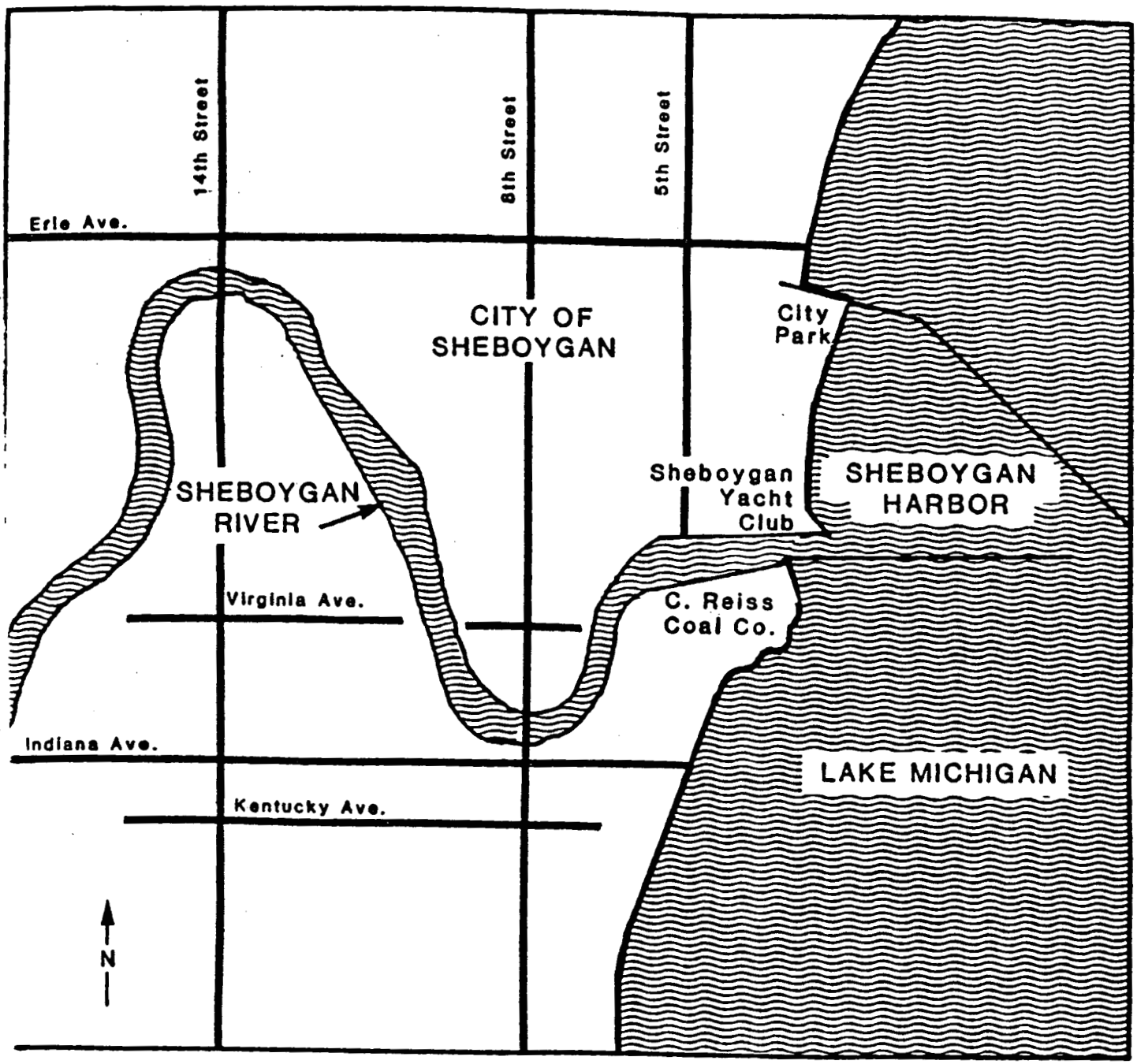


Exhibit 2

SHEBOYGAN RIVER AND HARBOR SITE
SHEBOYGAN, WISCONSIN



Environmental Review Branch of the Office of Federal Activities a draft Environmental Impact Statement (EIS), which included plans for the construction of a CDF and for renewal of dredging in the Sheboygan River and Harbor. U.S. EPA began reviewing the EIS, but during the review process, the Wisconsin Department of Natural Resources (WDNR) announced that they had sampled sediments from the Sheboygan River and Harbor and found Polychlorinated biphenyls (PCBs) at concentration levels exceeding 50 parts per million (ppm). Based on these findings, U.S. EPA denied approval of the proposed project because the Sheboygan River and Harbor sediments, if dredged, would pose a potential health threat, and be subject to disposal requirements for PCBs under the Toxic Substances Control Act (TSCA). Passed in 1976, TSCA allows U.S. EPA to regulate unreasonable risks at any stage in a chemical's life, including manufacturing, processing, distribution, use, or disposal. PCB regulations were promulgated under the authority of TSCA.

Following the discovery of PCBs in the Sheboygan Harbor and River, WDNR conducted an investigation of potential sources of contamination. WDNR identified Tecumseh Products of Sheboygan Falls as a source of PCB-contamination and required the company to fund an investigation and cleanup of its property. Contractors hired by Tecumseh removed PCB-contaminated soils from the area around their property, and conducted PCB monitoring at the site. No PCB-contaminated sediments were removed from the harbor or river at that time.

In an effort to maintain a navigable harbor while seeking an acceptable long-term method for the dredging and disposal of PCB-contaminated sediments, the COE submitted a proposal in 1981 to dredge the area in front of the Carl Reiss Coal Company dock, and to avoid dredging areas containing sediments with PCB levels exceeding 50 ppm. Implementation of the COE proposal is dependent on securing an acceptable

local disposal site and on U.S. EPA approval of the site. The city considered donating land within the city industrial park, but because of concerns regarding long-term liability, the city decided against use of their property as a disposal site. The COE is currently searching for an acceptable disposal site to implement the limited dredging program. Meanwhile, the COE has periodically dredged the Sheboygan Harbor entrance, in selected areas, to allow for navigation. These dredged materials have been deposited in offshore water of Lake Michigan.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), more commonly known as "Superfund", was passed in 1980. This law authorizes the Federal government to respond directly to releases of hazardous substances that may endanger public health or welfare or the environment. In 1984, U.S. EPA announced plans to transfer funds from the Great Lakes National Program Office to the Superfund Program to investigate the type and extent of pollution at the Sheboygan River and Harbor site and its effects on human health and the environment. The Sheboygan River and Harbor site is of particular interest to the Great Lakes Program because it is a typical Great Lakes harbor.

Following reassignment of the Sheboygan site to the Superfund Program, CERCLA enforcement officials conducted a search for potential responsible parties (PRPs) and began negotiating with the PRPs. Funding for the Superfund program expired in October 1985, which resulted in a slow down of work at some Superfund sites. Despite reauthorization delays, work on the Sheboygan River and Harbor project has not been affected, because the RI/FS is privately funded by a PRP. In late March 1986, U.S. EPA, WDNR, and the PRP signed a consent order that requires the PRP to conduct the RI/FS at the site, but all community relations activities will be conducted by the U.S. EPA.

B. Community Background

1. Community Profile

The City of Sheboygan, located mid-way between Milwaukee and Green Bay along Lake Michigan, has a population of approximately 48,000 people. The community is fairly close-knit; many residents are descendants of central Europeans who immigrated to the Sheboygan area to work as skilled laborers for the area's emerging industries. Sheboygan supports a large number of prominent environmental, civic, and recreational groups. Many of these groups have been involved with the Sheboygan River and Harbor contamination problem.

The Sheboygan Harbor is used for commercial and recreational purposes. Sport fishing is one of Sheboygan's leading recreational industries; over one hundred charter boat captains operate out of the Sheboygan Harbor. Sheboygan promotes itself as a major center for sport fishing on Lake Michigan. WDNR stocks salmon and trout in the waters around Sheboygan Harbor. Development of a recreational marina in the Sheboygan Harbor to promote growth in the fishing and tourist industries is a priority plan for the community. The city's plans for development of the Sheboygan Harbor have been complicated by the contamination problem at the Sheboygan site.

A major user of the Sheboygan River and Harbor is the Carl Reiss Coal Company, a primary supplier of coal to central Wisconsin electric utility companies. The navigation channels in the Sheboygan Harbor are only a few feet below the minimum depth necessary for navigation of the large coal ships through the Sheboygan Harbor. Continued delays in dredging may cause future coal delivery operations to the Carl Reiss Coal Company dock to be suspended. Beginning in 1975, high lake levels temporarily alleviated the situation for barges. With the economic pressures for dredging removed, the COE announced in September 1986, that it could not justify dredging in the Federal channel at this time.

The City of Sheboygan is governed by a full-time mayor and a city council consisting of eight aldermen. The city has its own health department along with departments of public works and water utility and a harbor commission. The city employs a full-time harbormaster, who oversees all activities in the Sheboygan River and Harbor. Sheboygan County sells State fishing licenses which are available at the Sheboygan County Court House and at various tackle and bait shops, taverns, and drug stores throughout the county.

2. History of Community Concern

The Sheboygan community has been aware of a problem at the Sheboygan River and Harbor since the COE discontinued dredging in 1969. Citizens became concerned because commercial and recreational activities in the Harbor require that the Sheboygan Harbor be navigable. Community concern increased considerably in 1978, after the State announced the discovery of levels of PCBs above Federal standards in Sheboygan River and Harbor sediments. In August 1978, WDNR first issued health warnings and fish advisories recommending that no fish other than trout or salmon be consumed from the Sheboygan River. Following the Food and Drug Administration's lowering of acceptable PCB levels for fish consumption from 5 parts per million (ppm) to 2 ppm in 1984, WDNR altered their fish advisory to recommend that no fish from the Sheboygan River be consumed. Issuance of these warnings raised citizen concern and awareness about health effects associated with PCB contamination.

In May 1983, concerned citizens in the Sheboygan area founded the Sheboygan County Water Quality Task Force to address problems within the Sheboygan River and Harbor. The task force, which represents a wide range of interests, consists of about twenty-five members from environmental, civic, commercial and recreational groups, as well as the local government. The major goals of the task force include working with

the appropriate government agencies for a total cleanup of the PCBs at the Sheboygan River and Harbor site; completing a limited dredging program of the Sheboygan Harbor; and planning and developing a marina for the Sheboygan Harbor. In September 1985, the task force received a $29,000 grant from the Wisconsin Coastal Zone Management Program to continue their work on the Sheboygan site. The task force employs part-time professional staff, who interact with all levels of government.

Task force members had become frustrated in their attempts to secure a remedy of the PCB problem. They explored several options ranging from generating political pressure to obtaining funds for supplementing the limited dredging program proposed by the COE. In 1984, the task force requested that U.S. EPA provide funding for a cleanup under Section 115 of the Clean Water Act. U.S. EPA informed the task force that funds under Section 115 were not available. In September 1985, the site was proposed for the NPL, thus making funding available under the Superfund program. The site was placed on the final NPL in June 1986.

Two weeks after the site was proposed for the NPL, the task force sponsored a two-day technical workshop on the Sheboygan site. Several Regional, State, and Federal agency representatives were invited to attend. The task force requested that each participating agency present detailed information regarding its responsibilities and legal authority at the Sheboygan River and Harbor site; identify any conflicts between agencies working on the Sheboygan contamination problem; identify all water quality standards which must be met; and present several technically acceptable solutions to the problem. The meeting was well attended but no decision regarding resolution of the contamination problem was reached. U.S. EPA Superfund staff made a presentation outlining in detail the Superfund program.

In February 1986, the Sheboygan Water Quality Task Force held another meeting at which the U.S. EPA Community Relations Coordinator presented an overview of the Superfund program, along with a general description of

community relations activities proposed for the Sheboygan site. The task force expressed its willingness to work with U.S. EPA, but remains concerned about how soon the remedial action will begin at the site and about resolving possible conflicts between the Superfund project field work, the COE, and possible marina construction.

3. Current Community Concern

The Sheboygan community has been aware of the PCB contamination problem since approximately 1978. During this time, community members have become frustrated with the lack of remedial action at the site. Overall community awareness appears to be constant, but the intensity of current concern varies among organized interest groups and individual community members. The major concerns identified by members of the Sheboygan community during on-site discussions are identified below.

(a) Residents' Frustration over Lack of Site Activity. Sheboygan officials and residents said that government agencies have been extremely slow to take any action at the site. They attribute this delay to a lack of coordination among the various Federal and State agencies. They also expressed frustration in dealing with complicated Federal and State regulations and procedures. Since the proposal of the site for the NPL in September 1985, the task force has been particularly anxious for the U.S. EPA to begin work at the site. Numerous studies have been completed on the Sheboygan River and Harbor contamination problem. Sheboygan officials and residents said that the Sheboygan site has been studied "to death". In addition, members of the task force have been frustrated by the failure of agency officials to locate a suitable disposal site for dredged contaminated sediments. The task force and other community members are concerned that the PCB problem will adversely influence local tourism, recreational fishing and boating, and commercial shipping industries; therefore, they believe a timely solution is imperative.

(b) Health Concerns. Several residents and interest groups expressed concern about consuming PCB-contaminated fish from the Sheboygan River and Harbor, and the possible results this could have on their health. Despite WDNR warnings against consuming fish from the Sheboygan River and Harbor, some Sheboygan residents continue to catch and consume the fish.

(c) Economic Impact. Local officials and members of various interest groups expressed concern about the impacts of PCB contamination on tourist, commercial, and recreational activities within the Sheboygan River and Harbor area. In particular, community members fear the shipping and coal industries may be affected if the Sheboygan Harbor cannot be kept navigable. Members of sport and commercial fishing groups and the charter boat captains' association are worried that the PCB contamination problem will continue to have negative effects on their businesses. The issuance of State health advisories for fish consumption has noticeably affected the fishing and boating industries; therefore, these groups would like the remedial action developed and implemented as soon as possible.

There also is concern about the future growth of the Sheboygan Harbor area. Citizens interested in the development of a recreational marina within the Sheboygan Harbor claim that an impasse on a solution to the PCB problem in Sheboygan has stymied growth of the community. Sheboygan officials also commented that the city faces stiff competition from neighboring port towns, which have already developed recreational marina facilities within their harbors.

C. Highlights of the Community Relations Program

The current high level of citizen concern indicates the need for a community relations program that is carefully tailored to address the specific concerns of the Sheboygan community. Highlights of the community relations program are described below.

1. Maintain a central contact at U.S. EPA to provide quick and reliable responses to any questions concerning the site raised by area residents, local officials, organizations or local news media. Judy Beck, the U.S. EPA Region V Superfund Community Relations Coordinator, has been designated as the central contact to respond directly to public inquiries regarding site activities. Ms. Beck also will be responsible for filing all site-related information at the information repositories identified in Appendix B. Bonnie Eleder is the U.S. EPA Region V Remedial Project Manager for the site.

2. Provide community members with accurate and timely information about the site. Information repositories have been established at the Mead Public Library, Sheboygan City Hall, and the Sheboygan County Water Quality Task Force Office. Addresses and contacts for each of these buildings are listed in Appendix B. The work plan, final community relations plan, fact sheets, technical summaries, draft RI and FS reports, responsiveness summary, and any other site-related materials will be placed in the repositories as this information becomes available.

It is suggested that any fact sheets also be made available at locations issuing fishing licenses. This should ensure that local citizens and tourists fishing in the Sheboygan area are aware of the RI/FS activities and any findings at the site.

3. Educate area residents and local officials about the procedures, policies, and requirements of the Superfund program. Sheboygan residents have been aware of the PCB problem in the Sheboygan River and Harbor for

many years, but the site has only recently been included on the NPL. Sheboygan residents, therefore, need to be provided with general information on the Superfund program, and specific information on the expected remedial schedule. This information should be placed in the information repositories and provided to the Sheboygan Press. Preparation of a fact sheet on PCBs could help clarify citizens' misconceptions about the regulation and disposal of PCBs and the health risks associated with PCBs.

4. Provide information to the public prior to initiation of the RI/FS. Sheboygan residents and local officials are eager for remedial activities at the site to begin. A public meeting was held early in the remedial process at which U.S. EPA explained the Superfund program, presented the proposed RI/FS schedule for the site, and explained the negotiated settlement. Suggested newspapers for placing meeting announcements are the Sheboygan Press and the Lakeshore Chronicle. The meeting will be coordinated with the Sheboygan mayor and not conflict with city council meetings. (The City of Sheboygan usually holds council meetings on Monday, Tuesday or Wednesday nights.) A suggested location for any public meeting is the meeting room in the Mead Public Library, which holds approximately 100 people or the Wisconsin Bank building, which accommodates 75 people.

5. Inform Sheboygan City and County officials and other local, State, and Federal officials in advance of all on-site plans, developments and findings prior to public release of this information. Notification of appropriate local officials before the site activities begin will ensure that they are well informed about site developments and are able to provide knowledgeable reponses to citizen inquiries. Because of the involvement of several other State and Federal agencies with the site, it is important that officials of these agencies also be kept informed of all site-related activities.

6. Provide news releases to the media. In the past few years, a reporter from the Sheboygan Press has been writing on a regular basis about the PCB problem in Sheboygan. It is recommended that U.S. EPA establish a working relationship with this person and with reporters from other area newspapers and media by providing well-prepared news releases on activities and plans for the site. This will help to ensure that site-related activities are covered accurately.

7. Provide opportunities for public comment on the remedial action alternatives. After the FS report is completed, a four-week public comment period will be held. U.S. EPA will conduct a public meeting during the FS comment period to explain the findings, the recommended alternatives, and the process U.S. EPA will use to choose among the alternatives. Sheboygan residents already have expressed great interest in participating in the decision-making process concerning the remedial action alternatives; therefore, EPA should anticipate citizen inquiries regarding selection of the preferred alternatives. Prior to this meeting, an announcement in the Sheboygan Press, Shoreline Chronicle, and Sheboygan Falls News of dates for the public comment periods, the date and place for the public meetings, and the procedures for commenting on the consent order and feasibility study would ensure that Sheboygan residents are informed about opportunites for public comment on the proposed remedial action.

8. Estabish and maintain informal contact with citizens and members of interested organizations. Several interest groups in Sheboygan have been actively involved with the site. Many of these groups hold regular meetings and U.S. EPA participation in these meetings would provide a convenient opportunity to discuss the status of site activities and to answer questions regarding the site.

9. Provide updated information to the community regarding site activities. In addition to fact sheets summarizing RI and FS results, updates detailing the project's status will be distributed on a periodic basis throughout the RI/FS.

D. Community Relations Activities and Timing

Specific community relations activities that are recommended for the Sheboygan River and Harbor site are listed below as they correspond to technical milestones. A schedule is also provided at the end of this section.

Technical Milestone	Community Relations Activities
1. Prior to initiation of the remedial investigation	o Establish information repositories. o Designate information contact at U.S. EPA. o Hold a public meeting to explain the negotiated settlement, present the final work plan and proposed RI/FS schedule, and answer citizen questions. o Place information on Superfund procedures in information repositories. o Prepare news releases and fact sheets, as needed, informing Federal, State, and local officials prior to any release of information.
2. During the remedial investigation	o Maintain telephone contact with Federal, State and local officials. o Release periodic updates on RI activities. o Hold informal meetings with interested organizations on an as-needed basis to respond directly to citizen inquiries about site developments. o Prepare news releases, as needed. o Meet with local officials regularly to discuss site developments.

3. Upon completion of the remedial investigation	o Schedule meetings with Federal, State, and local officials to discuss RI findings and FS methodology. o Conduct informal sessions with citizens, members of interested organizations and/or key community leaders to invite citizen participation during consideration of remedial alternatives. o Prepare news releases announcing findings of RI.
4. During the feasibility study	o Maintain telephone contact with Federal, State, and local officials. o Prepare fact sheets, as needed, and inform Federal, State, and local officials prior to any news release.
5. Upon completion of the feasibility study report	o Schedule meetings with Federal, State, and local officials to discuss U.S. EPA's preferred remedial alternative. o Prepare fact sheet and news releases explaining RI findings and the remedial alternatives considered during the FS. o Provide four-week public comment period on the feasibility study report. o Hold a public meeting during public comment period to solicit citizen comment on the remedial alternatives considered. o Prepare responsiveness summary after public comment period is completed.

6. Upon completion of the record of decision	o Maintain telephone contact with Federal, State, and local officials. o Prepare news releases announcing final selection of remedial alternatives. o Initiate revision of community relations plan.
7. Prior to initiation of remedial design and remedial action	o Schedule meetings with Federal, State, and local officials to discuss U.S. EPA remedial action plans. o Prepare news releases and hold a press briefing to inform the public about U.S. EPA's remedial action plans. o Conduct informal sessions on selected remedial alternatives with members of interested organizations and community leaders.

E. SCHEDULE AND STAFFING PLAN

Community relations activities at the Sheboygan River and Harbor site will be coordinated by Bonnie Eleder, the U.S. EPA Region V Remedial Site Project Manager, and Judy Beck, the U.S. EPA Region V Superfund Community Relations Coordinator. Community relations contractor assistance will be provided as requested.

Community Relations Technique	Finalization of the Work Plan	During Remedial Investigation	Completion of the Remedial Investigation	During the Feasibility Study (FS)	Completion of the FS Report	Completion of Record of Decision	Initiation of Remedial Action
1) Information Repositories	X	---------- update as needed ----------					X
2) Establish Information Contact	X						
3) Meetings and Telephone Contact with Local Officials	X	---------- X ----------	X	------ hold as needed -----	X	----------	X
4) Fact Sheets/Updates	X	---------- provide as needed ----------			X		X
5) News Releases	X	------ provided as needed -----	X	----------	X	X	
6) Four-Week Public Comment Period					X	----------	X
7) Public Meetings	X				X		
8) Informal Information Sessions		X ----------	X	-------- hold as needed ----------		X	
9) Responsiveness Summary					X		
10) Press Briefing							X
11) Revised Community Relations Plan						X	

This schedule is subject to change based on changes in the technical schedule for the Sheboygan River and Harbor site.

APPENDIX A

LIST OF CONTACTS AND INTERESTED PARTIES

A. FEDERAL ELECTED OFFICIALS

Senator William Proxmire (202) 224-5653
Washington, DC Office
531 Dirksen Building
Washington, DC 20510

District Office (414) 272-0388
The Federal Building
517 East Wisconsin Avenue
Milwaukee, WI 53202

Senator Bob Kasten (202) 224-5323
Washington, DC Office
340 Russell Building
Washington, DC 20510

District Office (414) 291-4160
The Federal Building
517 East Wisconsin Avenue
Milwaukee, WI 53202

Representative F. James Sensenbrenner (202) 225-5101
Washington, DC Office
2444 Rayburn Building
Washington, DC 20515

District Office (414) 784-1100
120 Bishops Way
Brookfield, WI 53005

Representative Thomas Petri (202) 225-2476
Washington, DC Office
1024 Longworth House
Washington, DC 20515

District Office (414) 922-1180
14 Western Street
Fond du lac, WI 54935

B. STATE ELECTED OFFICIALS

Governor Anthony Earl (608) 266-1212
Room 115 East
State Capitol Building
Madison, WI 53702

State Senator Carl Otte (608) 266-2056
State Office
Box 7882
State Capitol Building
Madison, WI 53707

District Office (414) 457-3280
1440 South 22nd Street
Sheboygan, WI 53801

Representative Calvin Potter (608) 266-0656
State Office
Box 8953
State Capitol Building
Madison, WI 53708

District Office (414) 452-6875
808 Greentree Road
Kohler, WI 53044

Representative Wilfrid Turba (414) 266-8530
State Office
Box 8953
State Capitol Building
Madison, WI 53708

District Office (414) 894-2822
Route 2
Box 106
Elkhart Lake, WI 53020

C. LOCAL ELECTED OFFICIALS

Mayor Richard J. Schneider (414) 459-3317
City Hall
828 Center Avenue
Sheboygan, WI 53081

Harold Lindermann, Chairman (414) 459-3103
Sheboygan County Commissioners
Sheboygan County Court House
615 North 6th Street
Sheboygan, WI 53801

D. STATE AGENCY OFFICIALS

Wisconsin Department of Natural Resources
101 South Webster Street
GEF 2, P.O. Box 7921
Madison, WI 53707

Richard E. O'Hara, Section Chief (608) 266-0833
Hazardous Waste Management Section

Mark Giesfeldt, Leader (608) 267-7562
Environmental Response and
Restoration Unit

Larry Sperling (608) 266-8172
Bureau of Information and Education

Dennis Kugle (608) 267-2465
Bureau of Solid Waste

Wisconsin Department of Natural Resources
Southeast District
2300 North Dr. Martin Luther King Jr. Drive
P.O. Box 12436
Milwaukee, WI 53212

Gloria McCutcheon (414) 562-9510
Southeast District Director

Frank Trcka (414) 562-9540
Assistant Environmental Impact
Coordinator

John Nelson (414) 562-9516
Public Information Officer

E. LOCAL AGENCIES

Sheboygan Health Department (414) 459-3486
Sol Belinky
709 North 7th Street
Sheboygan, WI 53081

Sheboygan Harbor Commission (414) 457-4861
Ames Seefeld, Chairman
Philip Aigner
John Gabrielse
John Thornton
Wesley Schaetzer

Sheboygan Chamber of Commerce (414) 457-9491
Scott C. Wilson
P.O. Box 687
Sheboygan, WI 53081

Sheboygan Planning Department (414) 459-3377
Frank Paquette
City Hall
828 Center Avenue
Sheboygan, WI 53081

F. FEDERAL & REGIONAL AGENCIES

U.S. EPA Region V
230 South Dearborn Street
Chicago, IL 60604

Judy Beck — (312) 353-1325
Superfund Community Relations Coordinator

Bonnie Eleder — (312) 886-4885
Remedial Project Manager

U.S. Army Corps of Engineers — (414) 388-3720
Bob Mundelius
Kewaunee Area Office
Kewaunee, WI 54216

U.S. Fish and Wildlife Service — (414) 465-2682
Timothy J. Kubiak
University of Wisconsin
Socio-Ecology Building, Room 480
Green Bay, Wisconsin 54302

Wisconsin Coastal Zone Management Agency — (608) 267-7982
Tenace Mattiesen
101 South Webster Street
Madison, WI 53702

Bay Lakes Regional Planning Commission — (414) 465-2135
Ralph Bergman, Executive Director
Socio-Ecology Building, Suite 450
University of Green Bay
Green Bay, WI 54302

G. MEDIA

Newspapers

Sheboygan Press (daily) — (414) 457-7711
P.O. Box 358
632 Center Avenue
Sheboygan, WI 53081

Sheboygan Falls News (daily) — (414) 467-6591
504 Broadway
Sheboygan Falls, WI 53085

The Plymouth Review (daily) — (414) 893-6411
113 East Mill Street
Plymouth, WI 53073

Shoreline Chronicle (Wed. & Sun.) (414) 459-8820
1313 Michigan Avenue
Sheboygan, WI 53801

Television

WBAY-TV (Channel 2) (414) 437-5411
115 South Jefferson
Green Bay, WI 54300

WFRW-TV (Channel 5) (414) 437-5411
P.O. Box 1128
Green Bay, WI 54303

WLUK-TV (Channel 11) (414) 494-8711
P.O. Box 7711
Green Bay, WI 54303

Radio

WKTS (950 AM) (414) 457-5561
1156 Union Avenue
Sheboygan, WI 53081

WHBL (1330 AM) (414) 458-2107
WWJR (98FM)
2100 Washington Avenue
Sheboygan, WI 53081

WPLY (1420 AM) (414) 467-4891
Route 1
Highway 57
Plymouth, WI 53073

H. OTHER INTERESTED ORGANIZATIONS

Sheboygan County Water Quality Task Force (414) 457-9453
John Strauss, Chairman
631 New York Avenue
P.O. Box 687
Sheboygan, WI 53082-0687

MEMBERS

Mr. Robert Biever
Carl Reiss Coal Company
P.O. Box 688
Sheboygan, WI 53081
(414) 457-4411

Ms. Barbara Ebenreiter
Kohler Co.
Kohler, WI 53044
(414) 457-4441

Mr. Brian Hoffman
[redacted]

Mr. Robert Koenig
[redacted]

Mr. Werner W. Krause
Vinyl Plastics, Inc.
P.O. Box 451
Sheboygan, WI 53081
(414) 458-4664

Mr. Harold Lindermann
[redacted]

Mr. Frank Trcka
[redacted]

Mr. John P. Repphun
[redacted]

Mr. Roy Sebald
[redacted]

Mayor Richard J. Schneider
City Hall
828 Center Avenue
Sheboygan, WI 53081
(414) 459-3317

Mr. Herman Schwartz
[redacted]

Mr. Wilfrid Turba
[redacted]

Mr. Scott C. Wilson
Chamber of Commerce
P.O. Box 687
Sheboygan, WI 53081
(414) 457-9491

Sheboygan County Conservation Association (414) 528-7071
Edward Harvey
302 Francis Avenue
Cascade, WI 53011

Sheboygan County Audobon Society (414) 452-8511
John Eisner
710 Bluff Avenue
Sheboygan, WI 53081

Izaak Walton League (414) 452-3246
Roy Sebald
1912 South 13th Street
Sheboygan, WI 53081

League of Women Voters (414) 452-6328
Diane Dickinson
122 Grafton Court
Kohler, WI 53044

APPENDIX B

POSSIBLE SITES FOR INFORMATION REPOSITORIES AND PUBLIC MEETINGS

A. Public Information Repositories

Mead Public Library (414) 459-3400
710 Plaza 8
Sheboygan, WI 53081

Contact: E. R. Kunert
Hours: 9 a.m. - 9 p.m. (M-F)
9 a.m. - 5 p.m. (Sat.)
1 p.m. - 5 p.m. (Sun.)

Chamber of Commerce (414) 457-9491
631 New York Avenue
Sheboygan, WI 53081

Contact: Scott Wilson
Hours: 9 a.m. - 5 p.m. (M-F)

City Hall, Second Floor (414) 459-3364
828 Center Avenue
Sheboygan, WI 53081

Contact: City Clerk, Lawrence Felton
Hours: 8 a.m. - 12 p.m. (M-F)
1 p.m. - 5 p.m. (M-F)

Sheboygan County Court House, (414) 459-3002
First Floor
615 North 6th Street
Sheboygan, WI 53081

Contact: County Clerk, Patricia Drayner
Hours: 8 a.m. - 5 p.m.

B. Public Meeting Location

Mead Public Library (414) 459-3400
710 Plaza 8
Sheboygan, WI 53081

Contact: E. R. Kunert
Capacity: 100 persons

First Wisconsin Bank (414) 459-6000
P.O. Box 328
Sheboygan, WI 53082 X no longer does night meetings 2/24/87

OEPA

COMMENTS ON WORK PLAN VOLUME

1. Page 1-1, first paragraph, line 13: Typo - Greater Miami River should be Great Miami River.

2. Page 1-3, Section 1.3, second paragraph, lines 7 and 8: Sentence should read ...environmental impacts associated...at the FMPC are thoroughly and adequately investigated....

   Page 1-3, Section 1.3, second paragraph, last line: SARA stands for Superfund Amendments and Reauthorization Act of 1986.

3. Page 1-3, second bullet: Change "chemical components in air, soils,..." to chemical contaminants or pollutants in air, soils,....

4. Page 1-4, third bullet: Change "most environmentally and economically acceptable alternatives in the FS" to most environmentally sound and cost-effective alternatives in the FS.

5. Page 1-4, Section 1.4, second paragraph: FMPC does not recommend remedial action alternative(s). This is left for USEPA to do based upon the alternative(s) evaluated in the FS and in consultation and concurrence with Ohio EPA.

6. Page 2-5, Section 2.1.3.1: The specific values for DOE's and the U.S. Public Health Service's guidelines for maximum uranium in drinking water should be specified. USEPA's recommended levels should also be given. Consideration must be given that the DOE and USPHS guidelines are probably antiquated and are no longer appropriate as guidelines.

7. Page 2-5, Section 2.1.3.3: No mention is made of the waste pits as sources of environmental concern in terms of their leaking and contaminating groundwater. This is certainly a concern of Ohio EPA.

8. Page 2-8, Section 2.2.1, first paragraph: Reference to pit #5 as having been operated until 1983 is misleading since it is currently in use for wastewater treatment.

9. Page 2-10, Section 2.2.4: Locations of fly ash piles and Southfield area should be shown on a site map. Also, the dates of operation of the Southfield area should be provided.

10. Page 2-11, Section 2.2.5, first paragraph: The first sentence does not make any sense. The other metals that are known to be present in the K-65 silos should be specified.

11. Page 2-13, Section 2.3.4: The last sentence does not make sense? In what will the various sumps and other types of subfloor reservoirs be included?

12. Page 2-25, Section 2.5.5, first paragraph: What are the private wells located to the south of the FMPC used for, if they are not used for potable water? Are they still accessible as a potable water source?

13. Page 2-25, Section 2.6.3, Ingestion: Any risk assessment must also consider ingestion of sediments from children playing in either Paddy's Run or the Great Miami River, as well as ingestion of contaminated ground water from existing or future wells.

14. Page 3-1, Section 3.1, first paragraph: How can one predetermine the most plausible remedial action alternatives for a site without conducting a complete RI in order to determine the nature and extent of contamination? This is counter to the intent of performing an RI under CERCLA/SARA and allows a PRP to ignore or downplay areas of potential environmental and public health concerns. The FMPC work plan is supposed to only identify potential remedial technologies applicable to the site and then assess data needs for the RI based on these technologies.

15. Page 3-1, Section 3.1, third paragraph: The analysis of remedial alternatives in an FS is concerned with more than just cost-effectiveness.

16. Page 3-2, Figure 3.1: An investigation of contaminant effects must be conducted on aquatic organisms in Paddy's Run and the Great Miami River.

17. Page 3-4, bullet item at top of page: The no action alternative serves as a baseline for environemental and public health evaluation, not for determination of cost-effectiveness. It must be understood that cost-effectiveness is secondary to public health and environmental considerations.

18. Figure 3.2: What do the small speck-like dots in some of the columns mean?

19. Figure 3.3: See comment #18 above.

20. Page 3-20, Section 3.4.1.3: This section appears to summarily dismiss groundwater treatment at the site without any sound justification. It is a well-documented fact that FMPC has contaminated groundwater, and some sort of groundwater extraction and treatment will undoubtedly be necessary. Cleanup standards as provided in section 121 of SARA would have to be met, including State applicable, or relevant, and appropriate requirements (ARARs). The second paragraph expresses concern that regional sources of groundwater pollutants would likely reduce the effectiveness of the pump and treat alternative. No evidence or data is given in the work plan to substantiate this. What regional sources, if any, could have an impact on this alternative? FMPC is fairly well isolated and it is doubtful this would occur. Even p. 2-17 of the Description of Current Situation stated that on-site production wells were not believed by Spieker and Norris (in their 1962 groundwater study of the area) to be influencing regional groundwater movement. The feasibility of groundwater pumping and treatment should not be determined in the RI/FS work plan, but instead should be determined in a properly conducted FS.

21. Page 3-26, Figure 3.4: See comment #18 above.

22. Page 3-29, Figure 3.5: See comment #18 above.

23. Page 3-32, Figure 3.6: See comment #18 above.

24. Section 3, general comment: Many of the discussions on potential remedial actions given in this section mention cost-effectiveness. It is inappropriate to be discussing cost-effectiveness until the remedial alternative evaluation stage of the FS.

25. Page 4-5, last paragraph: What is meant by a "reference level of 35 pCi/gram for uranium concentration in soils? Although the Federal Register notice in which this value appears is given in the text, the document is not readily available. Therefore, an explanation of the basis and appropriateness for using 35 pCi/gram as a "reference level" should be given here.

26. Figure 4.2: Although page 4-8 states that <u>all</u> waste storage areas will be sampled in order to characterize their contents, Figure 4-2 shows that no samples will be obtained from pit #6. Pit #6 must be sampled. In addition, sediments in the clear well should also be sampled and analyzed for HSL and radiological compounds.

27. Page 4-8: The first full sentence at the top of the page does not make sense.

28. Page 4-14, second full paragraph: The borings that are drilled around the waste pits must be back-filled with bentonite-cement grout.

29. Page 4-18, Section 4.2.1.6: The second paragraph in this section is out of place. It should be moved to Section 4.2.1.5 under Ground Water - Sampling Locations and Frequency.

30. Page 4-21, fourth bullet item: Miami River should be <u>Great</u> Miami River.

31. Page 4-21, Section 4.2.1.8, Methodology for Air Sampling: The name of the document EPA-600/4-77-027a should be provided. This work plan, once approved will be a public document and the public will not know what EPA document is being referred to here.

32. Page 4-24: Fish and benthic organisms must be collected at points as close as possible to plant discharges into receiving waters (i.e., Paddy's Run and Great Miami River).

33. Pages 4-44 through 4-47, Section 4.4.4: An Endangerment Assessment (EA) must be conducted at the FMPC that follows and is consistent with CERCLA/SARA, the USEPA document "The Endangerment Assessment Handbook" (August 1985), and the USEPA guidance document titled "Toxicology Handbook - Principles Related to Hazardous Waste Site Investigations" (August 1985). The purpose of an EA is to address the potential human health and environmental effects of a site under the no action alternative.

33. (continued) The heading "Public Health Risk Assessment" should be changed to "Endangerment Assessment." Under CERCLA/SARA and USEPA guidance, an EA consists of the following four elements:
    1. Identification of Contaminants of Concern
    2. Toxicity Assessment
    3. Exposure Assessment
    4. Risk Characterization

34. Section 4.4.4.1: "Hazard Identification" should be renamed "Contaminant Identification" to correspond with the above-mentioned guidance. The third bullet item in this section should not be included here, but instead should be included and discussed in the toxicity assessment portion of the EA. Contaminants of concern are usually selected on the basis of their intrinsic toxicological properties, because they are present in large quantities, or because of potentially critical exposure routes (i.e., being released into a drinking water supply).

35. Section 4.4.4.2: "Dose-Response Relationships" should be renamed Toxicity Assessment to be consistent with USEPA endangerment assessment guidance. A toxicity assessment is a two-step process consisting of a toxicological evaluation and a dose-response assessment. The toxicological evaluation is a qualitative evaluation of data to determine the nature and severity of actual or potential health and environmental hazards associated with exposure to a chemical or radiological substance. The evaluation also involves a critical evaluation and interpretation of toxicity data from epidemiological, clinical, animal, and in vitro studies resulting in a toxicity profile for each contaminant of concern.

    The dose-response assessment for noncarcinogenic chemicals utilizes quantitative indices for toxicity such as NOELs, NOAELs, LC_{50}, etc. that are identified during the toxicological evaluation to determine "acceptable" exposure levels for contaminants of concern which are not expected to cause adverse health effects. The "acceptable levels" can be expressed as acceptable daily intakes (ADIs), ambient air standards, water quality criteria, etc.

    The dose-response assessment for carcinogenic chemicals gives estimates of the probability that a specific adverse effect will occur.

36. Section 4.4.4.4: Risk characterization should integrate all of the information that is developed in the exposure and toxicity assessments to yield a complete characterization of all types of potential or actual risks at the FMPC including carcinogenic risks, noncarcinogenic risks, environmental risks, and risks to public welfare. Risks to public welfare include adverse effects on property values, future land uses, recreational and commercial activities, public perception and opinion, quality of life, etc.

37. Page 4-47, Section 4.4.4.5: The activities described in this section which are modeled after the Statement of Work (SOW) are flawed. Potential remedial actions are not screened or evaluated in the remedial investigation. The whole purpose for analyzing the site investigation results in relation to potential remedial technologies applicable to the site is to determine the adequacy of data quality and quantity to support the feasibility study and to identify any additional data needs. The screening and elimination of potential remedial actions is a task to be performed in the feasibility study.

38. Page 4-48, Section 4.4.4.6: The first paragraph states that the CLP list constituents will be compared to the recommended limits in Table 1 of 40 CFR 264.94 (note correct citation). Table 1 is a partial list of the maximum contaminant levels permitted by the National Primary Drinking Water Regulations in 40 CFR 141 and as such are more than just recommended limits. This entire section should be deleted because contaminants of concern should be identified and discussed as part of the endangerment assessment and cleanup standards for contaminants both on and off-site must be those specified in Section 121 of SARA and must include state ARARs. Those RCRA issues discussed in this section and in the SOW may be part of federal ARARs for FMPC and should be addressed in the FS.

39. Page 5-1, Section 5.1, first paragraph: A citation of the Superfund Amendments and Reauthorization Act of 1986 (SARA) should be provided.

40. Page 5-4, Section 53, second paragraph: Technologies must include both on-site and off-site remedies, depending on site problems.

(41.) Page 5-5, Section 5.4: Under SARA, treatment alternatives for source control actions must be developed (where feasible) ranging from an alternative that would eliminate the need for long-term management (including monitoring) at the site, to an alternative using, as the major element, treatment that would reduce the toxicity, mobility, or volume of site waste. Further, an alternative that involves waste containment with little or no treatment but provides protection of human health and the environment primarily by preventing potential exposure or reducing the mobility of the waste must be developed.

42. Page 5-5, sixth bullet item: These alternatives must closely approach the level of protection provided by any applicable or relevant standards.

43. Page 5-6, Section 5.5: Cost is to be considered last when initially screening alternatives. Cost is only to be used to discriminate among alternatives which provide similar results. Cost may be used to discriminate among treatment alternatives or nontreatment alternatives but not between treatment and nontreatment alternatives.

With respect to effectiveness, and in addition to providing protection to human health, welfare, and the environment, alternatives must be evaluated as to whether they attain federal and state ARARs or other criteria,

advisories, or guidance. Alternatives must also be evaluated for their ability to significantly and permanently reduce toxicity, mobility, or volume of hazardous constituents.

Alternatives that rely on unproven or innovative technologies should be carried through the initial screening when there is reasonable belief that the technology offers potential for better treatment performance or implementability; will have fewer or lesser adverse impacts than other available approaches; or will have lower costs for similar levels of performance than demonstrated treatment technologies.

44. Page 5-7, Section 5.6: Detailed analysis of alternatives must be consistent with SARA Section 121. The last sentence in the first paragraph should read: Alternative analysis will include....

The heading under Task 13a should be: Technical Analysis. Also, the first sentence before the bullet items should read: Technical Analysis.

45. Page 5-10, Section 5.7: The appropriate remedy for the FMPC site must be selected from those alternatives that:

1. are protective of human health and the environment.
2. except as provided under Section 121(d)(4) of SARA, attain applicable or relevant and appropriate federal and state public health and environmental requirements (ARARs) that have been identified by USEPA and Ohio EPA.
3. utilize treatment technologies and permanent solutions to the maximum extent practicable as determined by technological feasibility, availability, and cost-effectiveness.
4. are cost-effective, accomplishing a level of protection that cannot be achieved by less-costly methods.

COMMENTS ON DESCRIPTION OF CURRENT SITUATION VOLUME

1. Page 3-69, Section 3.8.2.2: Discussion of the 41 site monitoring wells is meaningless without their locations being identified on a site map and included in this section. It is not clear which "off-site" and "on-site" wells make up the 41-well monitoring system.

2. Page 3-70 and 3-71, Table 3.17: Perchloroethylene (#18 on list "D") and tetrachloroethylene (#44 on list "D") are the same compound.

3. Page 3-72, Table 3.18: Sampling points T1S, 1D are not shown in Figure 3.8. Why are the results of the remaining wells shown in Figure 3.8 not listed in Table 3.18? Footnote "b" does not make any sense.

4. Tables 3.18 and 3.19 should provide uranium concentration equivalents between pCi/l and µg/l.

5. Page 3-74, second bullet item: The first sentence uses poor grammar and its meaning is unclear. In the fourth bullet item, what is meant by the "TP" designation after the well numbers?

6. Page 3-81: Footnote "b" should indicate what calendar period constitutes a fiscal year.

7. Page 3-93, Section 3.8.4.1, second paragraph: What is a quadrat?

8. Page 3-93, Section 3.8.4.1, first, third, and fifth paragraphs: References to Figure 2.11 should be Figure 2.12.

9. Page 3-93, Section 3.8.4.2, last paragraph: Reference to Figure 2.9 should be Figure 2.12.

10. Tables 3.28, 3.29, 3.30, 3.31, 3.32, and 3.34: What is meant by "Bq/g" in the footnotes in these tables?

11. Page 4-8, Section 4.2.3.4, second paragraph: It should be stated what the contaminated private wells south of the FMPC are used for, if they are not currently used for a potable water supply and also whether these contaminated wells are still accessible by the public for potable or other use.

12. Page 4-9, Section 4.2.4.3: The ingestion mode must consider potential health impacts as a result of ingestion of surface soils or stream sediments by children playing in Paddy's Run or the Great Miami River.

13. Page 4-14, Section 4.3.3, first paragraph: The text should provide the basis for which 35 pCi/g is used by FMPC as a reference point for "acceptance of decontaminated areas."

COMMENTS ON SAMPLING PLAN VOLUME

1. Page I.I-1, Preliminary Evaluation, first paragraph: See concerns in comment #14 of the Work Plan Volume.

2. Page I.I-11, Section I.1.3, second paragraph: Explain what is meant by "Type IV" and "Type V" data.

3. Page I.1-1, Section 1.1, fourth paragraph: A ppm equivalent, if any exists, should be given for the 35 pCi/g used as a reference level for soils.

4. Page I.1-1, Section 1.1, last two paragraphs: Applicable pages of 40 and 46 CFR should be reproduced and included for reference in this work plan.

5. Page I.2-5, Section 2.4, second paragraph: Why will two different methods be used to obtain soil samples when the only difference in the soil samples appears to be that some will be 6-inch cores and some will be 2-inch cores?

6. Figures 2.1 and 2.2: Areas where 6-inch deep core samples will be obtained should be coincident with the areas of surface soil sampling using the fine grid system of Figure 2.1. Likewise, areas where 2-inch core samples are to be taken should be in those areas within the coarse grid system as identified in Figure 2.1.

7. Page I.3-1, Section 3.1: A sixth bullet item should be added that states that groundwater sampling is also being conducted in order to determine the extent (both vertically and horizontally) of contamination from FMPC.

8. Figures 3.1, 3.2, 3.3, and 3.4: Additional monitoring wells should be located immediately downgradient of waste pits #1, 2, 3, 5, and 6. Additional intermediate and/or shallow monitoring wells should also be located downgradient of the lime sludge ponds, fly ash piles 1 and 2, and the sewage treatment plant. Well 131 is not labeled on Figure 3.2.

9. Page I.3-8, Section 3.2.1, first paragraph: The proposed wells shown in Figure 3.2 do not fulfill the objective as stated in this paragraph - that it is "necessary to place a grouping of shallow wells immediately around the waste storage units...."

10. Page I.3-9, Section 3.2.2, first paragraph: The proposed shallow wells given in Figure 3.2 will only "isolate" groundwater contamination effects from pit #4, but not from pits #1, 2, 3, 5, or 6. Therefore, the objective of these wells as stated in this paragraph will not be met.

11. Page I.3-16, Section 3.3.3, first paragraph: The intermediate wells must extend at least five (5) feet above the water table to allow for seasonal fluctuations.

12. Page I.3-17, first paragraph: Monitoring well screens should be no longer than ten (10) feet.

13. Figure 4.2: Many of the proposed boring locations in this figure would make ideal locations for additional monitoring wells and should, therefore, be used as such.

14. Page I.4-9, Section 4.7.4: At least two samples per borehole which meet one or both of the criteria specified in this section should be subjected to a full HSL analysis. This section also appears to be contradictory to the last paragraph of Section 4.2.1.4 on page 4-14 of the Work Plan which states that a composite sample from each borehole from the new till wells will be tested for HSL organics and inorganics.

15. Page I.5-5, first full paragraph: If soil borings or surface soil samples on-site, especially around the waste pits, show the presence of organic compounds, then sediments from Paddy's Run and the Great Miami River will have to be resampled and analyzed for the complete list of CLP organics. There also seems to be some contradiction regarding the analysis (or lack

of analysis) of HSL compounds between this section and Section 4.2.1.6 (page 4-19) of the Work Plan which states that half of the surface water samples and sediment samples will be analyzed for HSL and additional site-specific parameters.

16. Page I.5-6, Figure 5.1: A sediment sample should be obtained immediately downstream of the discharge from the buried effluent line into the Great Miami River.

17. Page I.5-15, Section 5.8: How can sediment samples be field screened for TOC, TOX and general water quality parameters (i.e., metals, etc.)? All surface water locations shown in Figure 5.1 (including the location in comment #16) must have sediment samples collected and analyzed for TOC, TOX, and the general water quality parameters listed on page I.5-16.

18. Page I.6-2, Section 6.3.1.1, second paragraph: Typo - quadrant.

19. Page I.6-5, second bullet item: "Down-gradient" should be down-wind since the text is referring to agricultural crop and garden sampling.

20. Page I.6-6, third bullet item: Three samples of fish tissue should be analyzed from each surface water sampling location in both Paddy's Run and the Great Miami River.

21. Page I.6-7, Section 6.3.6: Because uranium and other radionuclides are known to occur on-site and the inherent uncertainties with pinpointing optimum locations for soil and sediment sampling based upon field screening, plant and animal tissues should be analyzed for all of the parameters listed on page I.6-7.

COMMENTS ON QAPP VOLUME

1. Page 2 of 2, Section 2.1: SARA should be cited here in addition to RCRA and CERCLA. Line 2 on page 2 of 2 should read: Liability Act, 42 USC 9601....

2. Page 2 of 2, second full paragraph: See concerns in comment #5 of the Work Plan Volume.

3. Page 27 of 63, Section 5.2, second bullet: Where potable water is used as a drilling fluid, samples of the fluid must be taken from the hose of the water tank/truck and analyzed for HSL compounds. This is to document that the "clean" drilling water has not been contaminated by what may have been in the tank prior to the tank's use at FMPC.

4. Page 27 of 63, Section 5.2: The sixth bullet item does not make any sense.

5. Page 28 of 63, Section 5.2, last bullet: Only air rotary drilling should be used for holes advanced into bedrock.

6. Page 30 of 63, second bullet: Sampling of soils in borings should be continuous to the base of the till and then every <u>five</u> feet or change in material thereafter.

7. Page 34 of 63, second bullet: Well screens should not exceed ten (10) feet in length.

8. Page 38 of 63, second bullet: Absolutely <u>no</u> mud should be used during well drilling.

ms

subject Comments on FMPC's Work Plan

1. Pg. 2-2. Identify soil types and properties based on Hamilton and Butler County Soil Surveys.

2. Pg. 2-5. The three off site wells showing contamination were at one time used for drinking purposes.

3. Pg. 2-7. Direct contact may come from the regional aquifer when bathing, washing and cooking.

4. Pg. 2-8. Waste Pit 6 is not inactive i.e. leachate from pit 4 goes to 6 then to 5. (At least until February, 1987)

5. If only pits 3 and 5 received liquid wastes, what happened to liquid wastes generated at the facility prior to 1959 when pit 3 was operational?

6. Include breaching of soil covers as a continuing potential source of contamination from the waste pits.

7. Pg. 2-10. The fly ash piles need to be shown on a site map.

8. Pg. 2-11. Leakage of leachate to Paddy Run through cracked silos should be a 4th issue in 2,2.5.

9. Pg. 2-13. Need to test existing underground tanks for leaks and remove old tanks which are leaking or out of use. UST

10. Pg. 2-21. Include perched groundwater flow into storm sewer outfall ditch and the clear well.

11. The storm water retention basin cannot hold a 10 year 24 hour storm event and thus cannot prevent discharges to Paddys Run.

12. Pg. 2-22. Include past protective pumping scenarios for protection of production wells from the waste pits.

13. Pg. 2-23. Most evident receptor of Paddys Run is local water supplies.

14. Pg. 3-5. Infiltration suggests a discharge to groundwater.

15. Pg. 3-20. Section 3.4.1.3 the option of groundwater pumping and treatment should not be eliminated from potential remedial action. Flushing of the aquifers in this case is inappropriate.

16. Pg. 3-22. Section 3.4.2.2 Background water quality should determine clean-up criterion and not water quality standards as suggested.

17. Pg. 3-25. Cost effectiveness should not be a consideration on remedial actions of pumping and treatment of groundwater off-site.

18. Pg. 3-30. The option to drill deeper wells to obtain potable water should not prevent remediation of the contaminated upper aquifer.

19. The work plan submitted is brief and references supporting documents in task 1 and 2 to fulfill the requirements of a work plan. This may not be adequate. (see task 3).

20. Pg. 4-48. Primary Drinking Water Standards should not be used to determine if groundwater contamination is occuring rather, background water quality data should be used for a comparison.

21. Pits 5 and 6 should be included as RCRA waste pits since leachate from pit 4 has been disposed of in both pits 5 and 6.

lmr

subject: Comments on Task 1 and 2 of the RI for FMPC

1. Table I.2 indicates modified proctor compaction tests on subsurface soils will be performed. Meaningfull measurements of permeability, density and consolidation must be performed on in-situ soils.

2. Figure 3.1 needs to include more downgradient monitor wells around the Fly ash pile #2, sanitary landfill pit 1 through pit 6.

3. Monitor well locations need to be located with respect to local and regional groundwater flow patterns, i.e. Sewage Plant, Scrap pile etc.

4. Groundwater investigations need to define if a cone of depression exists around the production wells and what effect this has on flow patterns in shallow and intermediate aquifers.

5. Section 3.3 Monitor well construction

   a. Hollow-stem augering is the prefered drilling method,
   b. Need to determine the frequency of soil sampling. Subsurface samples should be collected continuously until the detailed site specific setting is defined then sampling at 5 foot increments or at changes in lithology should be used for boreholes.
   c. If any water needs to be added during drilling
      i. Quantity and quality of water used must be recorded.
      ii. Samples of the drill water must be obtained at the hose before the water is pumping into the well,
      iii. During well development at least 5 times the amount of water added must be removed and 3 constant readings of pH, temperature and conductivety obtained at 5 minute intervals to insure proper well development.
   d. Abandonment of monitor wells should include pulling the well casing.
   e. How will well logs and the hydrogeologic setting be described in a similar manner if engineers and geologists are logging the samples? All soil samples should be retained and one qualified geologist should review the samples and correct the logs for consistancy when necessary. SWDO geologists would like to participate in this review of soil samples.

   f. Section 5 pg. 28 states several times that approval will be required if the field program varies from the plan. Who will approve? OEPA and USEPA should have direct input.

   g. A waver may be required for the use of PVC well casing.

   h. Pg. 34 Volume V section 5. States that 316 Stainless Steel well casing will be used while Volume 1 section 3 states PVC. Stainless steel wellscreens are preferred when low level VOC's are suspected.

i. Screen lengths should be limited to 10' lengths.

j. The use of a submersible pump may aid in removing fines during well development.

k. Water from well development, sampling or pump tests should be placed in a 55 gallon drum, tested and disposed of in the waste water system unless it can be shown that the water is not contaminated. In no case should this water be discharged to Paddys Run or other surface water without obtaining proper permits.

l. The method of drilling wells to be used for slug tests needs to be defined on pg. 51 in Section 5.

m. Injection wells should not be used for aquifer characterization.

n. Screen sand pack material should be designed for each specific formation to be monitored and should not be arbitrarily choosen.

6. Groundwater sampling should be conducted quarterly for at least the 1st year to determine seasonal fluxuations and trends in the water quality data. The sampling program can be revised based on review of the 1st years data.

7. Page I.3-22, 3rd paragraph; During decontamination of sample equipment, how will it be known if organics are present and warrant an acetone rinse?

8. Field filtration needs to be performed for metals. Page 3-22 states that radionuclide samples will also be filtered. May need to do total and dissolved radionuclides.

9. Should include Ammonia, COD and TOC for groundwater parameters on pg.3-2c.

10. Subsurface soil samples should be collected continuously in the till due to the depth of the waste pits and the heterogeneity of the soils.

11. Shelby tube samples of the blue clay should be taken for permeability testing and USCS soil classification.

lmr